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DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE MANUAL

INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS

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CONTROL, FREQUENCY SELECTOR C-2742/VRC

AND

CONTROL, RADIO SET C-2299/VRC

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DEPARTMENTS OF THE ARMY AND THE NAVY
APRIL 1973

TECHNICAL MANUAL
No. 11–5820–401–35–1
TECHNICAL MANUAL
NAVELEX 0967–432–3020

DEPARTMENTS OF THE ARMY
AND THE NAVY
WASHINGTON, D.C., *15 April 1973*

Direct Support, General Support, and Depot Maintenance Manual Including Repair Parts and Special Tools Lists CONTROL, FREQUENCY SELECTOR C–2742/VRC AND CONTROL, RADIO SET C–2299/VRC

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*This manual supersedes so much of TM 11–5820–401–35, 2 May 1962, including changes as pertains to Control, Frequency Selector C–2742/VRC and Control, Radio Set C–2299/VRC.

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CHAPTER 1

INTRODUCTION

1–1. Scope

a. This manual covers direct support (DS), general support (GS), and depot maintenance of Control, Frequency Selector C–2742/VRC (fig. 1–1) (ch. 2) and Control, Radio Set C–2299/VRC (fig. 1–2) (ch. 3). Repair parts lists for the controls are provided in appendixes B and C.

b. Operation, operator, and organizational maintenance, and organizational repair parts are provided in TM 11–5820–401–12.

1–2. Maintenance Forms and Records

Department of the Army forms and procedures used for equipment maintenance will be those prescribed in TM 38–750.

1–3. Reporting of Errors

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be made on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL–MA–CR, Fort Monmouth, N.J. 07703.

1–4. Official Nomenclature and Common Names

a. Official Nomenclature. Official nomenclature followed by (*) indicates all models of the equipment; thus—

(1) Receiver-Transmitter, Radio RT–246(*)/VRC represents RT–246/VRC and RT–246A/VRC.

(2) Receiver-Transmitter, Radio RT–524(*)/VRC represents RT–524/VRC and RT–524A/VRC.

(3) Receiver, Radio R–442(*)/VRC represents R–442/VRC and R–442A/VRC.

b. Common Names. The following common names are used to represent the indicated equipment:

Item	*Common name*	*Publication*
Radio Sets AN/VRC–12 and AN/VRC–43 through AN/VRC–49.	AN/VRC–12-series radios.	TM 11–5820–401–12
Receiver-Transmitter, Radio RT–246(*)/VRC or RT–524(*)/VRC.	Receiver-transmitter.	TM 11–5820–401 12
Microphone, Dynamic M–80/U; Headsets H–140A/U and H–251/U; Headset-Microphone H–161/U; Loudspeaker LS–454/U; and CVC helmet.	Audio accessories is a term used in this manual to apply to these and similar devices.	
Combat Vehicle Crewman Helmet T56–6 with Headset-Microphone Kit MK–1039/U as the audio accessory installed in it.	CVC helmet.	

1–5. Purpose and Use

a. Control, Frequency Selector C–2742/VRC (fig. 1–1). The C–2742/VRC is used with the RT–246(*)/VRC (fig. 2–1) to provide remote automatic selection of the 10 present frequencies that have been set up in the RT–246(*)/VRC. It can also turn off the power to the RT–246(*)/VRC and turn it on again to control the radiofrequency (RF) output power (high and low) of the RT–246(*)/VRC.

b. Control, Radio Set C–2299/VRC (fig. 1–2).

The C-2299/VRC is used with the receiver-transmitters of Radio Sets AN/VRC-49 and AN/VRC-45 to enable the radios to perform automatic retransmission of signals between radios that are too far apart to communicate directly with each other.

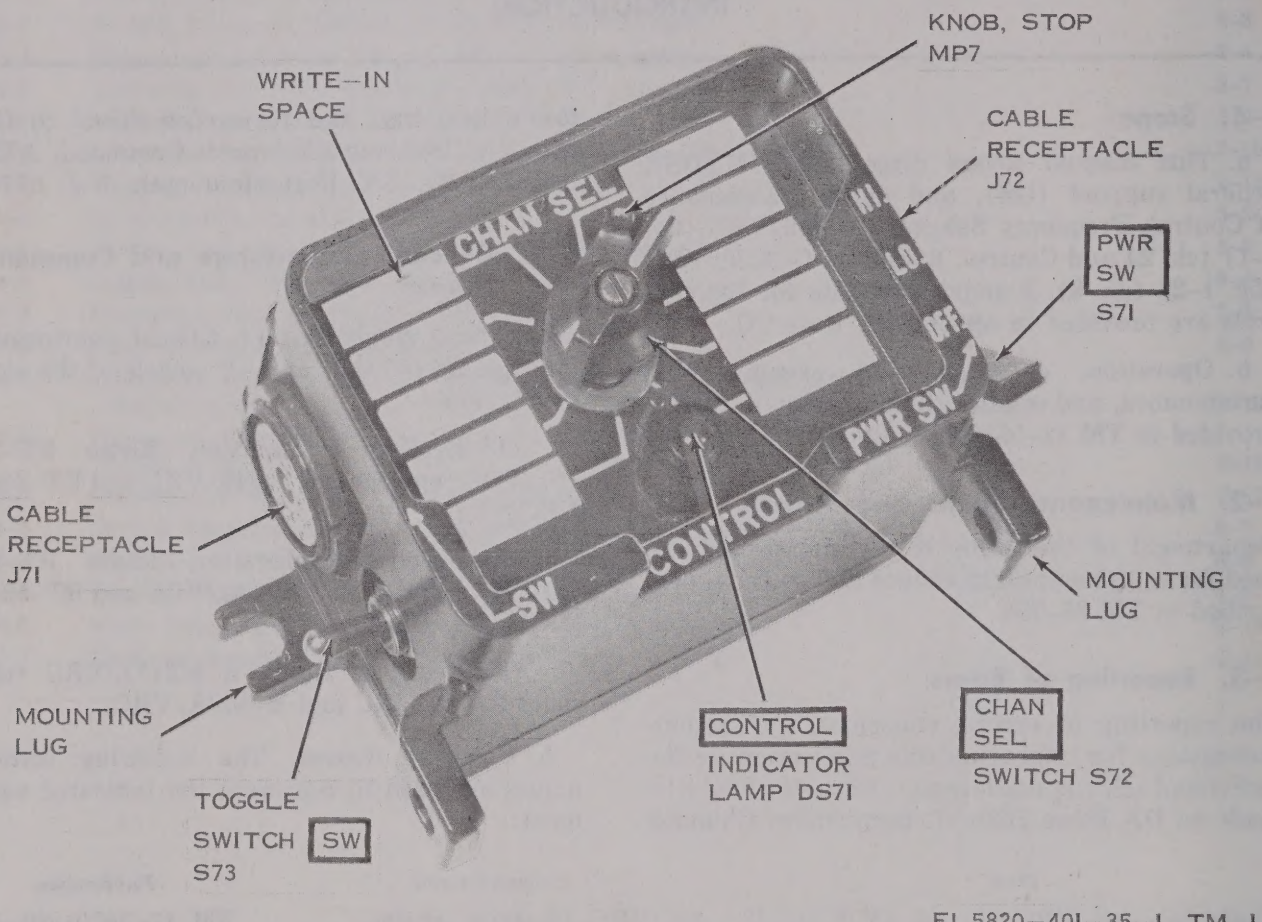


Figure 1-1. Control, Frequency Selector C-2742/VRC.

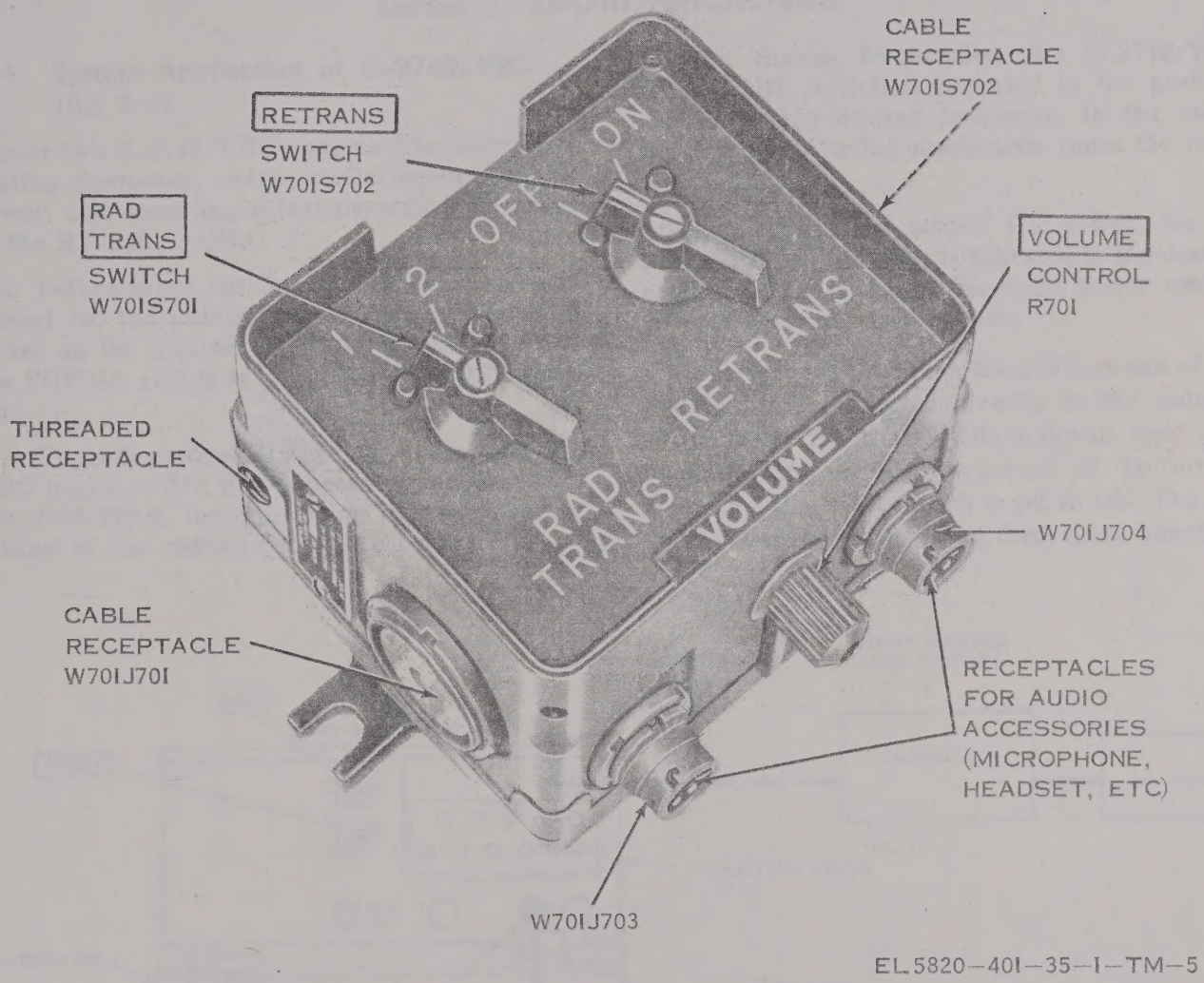


Figure 1-2. Control, Radio Set C-2299/VRC.

CHAPTER 2

CONTROL, FREQUENCY SELECTOR C-2742/VRC

Section I. CIRCUIT FUNCTIONING

2-1. System Application of C-2742/VRC (fig. 2-1)

One or two C-2742/VRC's are used to control operating frequency, output radiofrequency (RF) power, and operating direct current (dc) power of the RT-246(*)/VRC.

a. Before using the C-2742/VRC, the radio is turned on, the pushbutton circuits are adjusted to set up the desired operating frequencies, and the POWER switch is set to the REMOTE position.

b. To gain control of the radio, the C-2742/VRC toggle switch SW is operated momentarily. The CONTROL indicator lamp lights indicating control of the radio (*c*, *d*, and *e* below).

c. To change frequencies, the C-2742/VRC CHAN SEL switch is operated to the position containing the desired frequency. In the radio, the automatic tuning mechanism tunes the radio within 5 seconds.

d. To change the output RF power, the C-2742/VRC PWR switch is operated to the desired condition (HI or LO). The radio power control circuits respond automatically.

e. To turn off the radio, the PWR switch of the C-2742/VRC connected directly to the radio is set to OFF. The CONTROL indicator light goes out indicating the radio is turned off. To turn on the radio, the PWR switch is set to ON. The second C-2742/VRC cannot perform these functions.

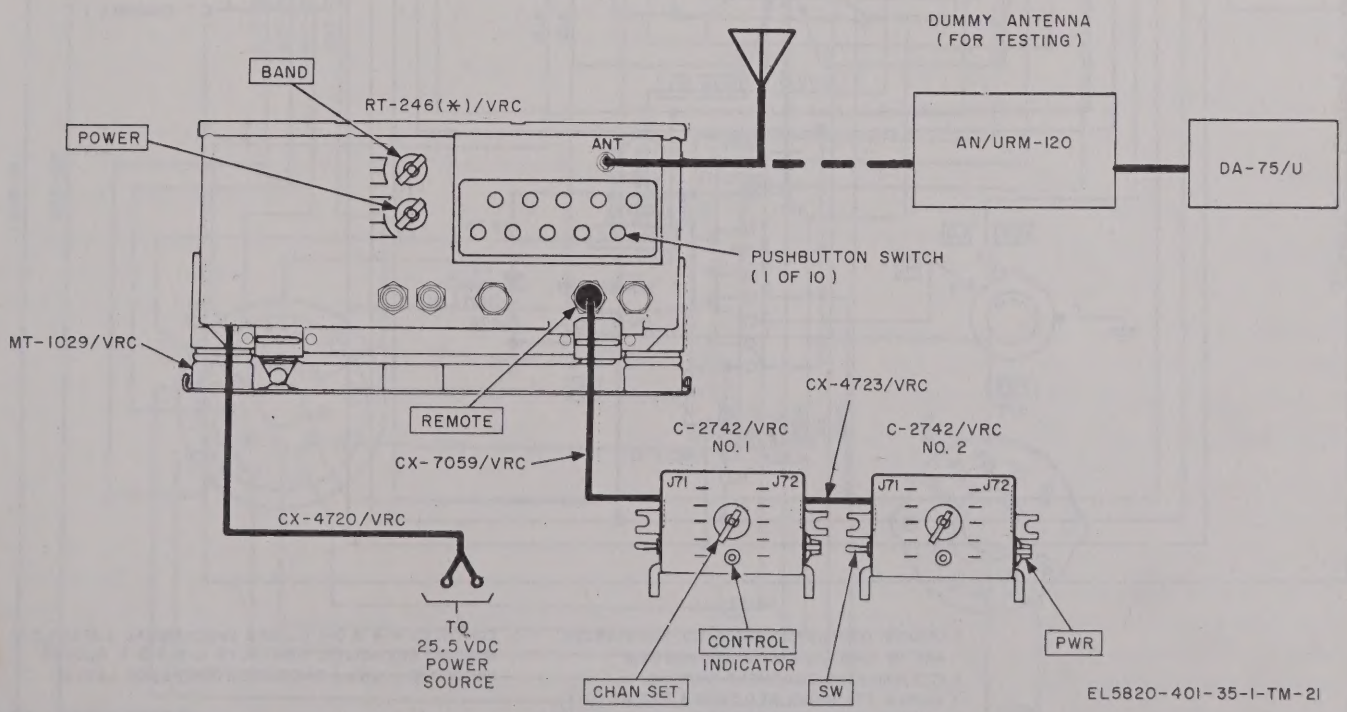


Figure 2-1. System application of C-2742/VRC.

2-2. Control, Frequency Selector C-2742/VRC, Circuit Functioning
(fig. 2-2)

The C-2742/VRC permits the selection of any one of the 10 preset frequencies on the RT-246(*)/VRC and also controls power to the RT-246(*)/VRC. Figure 2-3 is wiring diagram of the C-2742/VRC.

a. One C-2742/VRC in System. Momentary switch SW S73 provides a means of operating latching relay K71. Switch S72 momentarily applies a ground to coil 7-10 of relay K71 to release the locking mechanism and allow contacts 6-8 and 3-5 to come together. PWR switch S72 controls power to the RT-246(*)/VRC through terminals N and P of connector J71. When S72 is in the LO position, power is applied to the RT-246(*)/VRC by grounding contact N of J71. When S72 is in HI position, the RT-246(*)/VRC is turned on the high RF output power by grounding contact P of J71 through the contacts of K71 and S72. CONTROL indicator lamp DS71 lights to indicate that the C-2742/VRC has control of the RT-246(*)/VRC. CHAN SEL switch S71 functions similarly to the pushbutton switches on the RT-246(*)/VRC front panel by applying +25.5 volts dc through J71 to energize the relay in the RT-246(*)/VRC associated with the preset channel selected. Diode CR71 prevents volt-

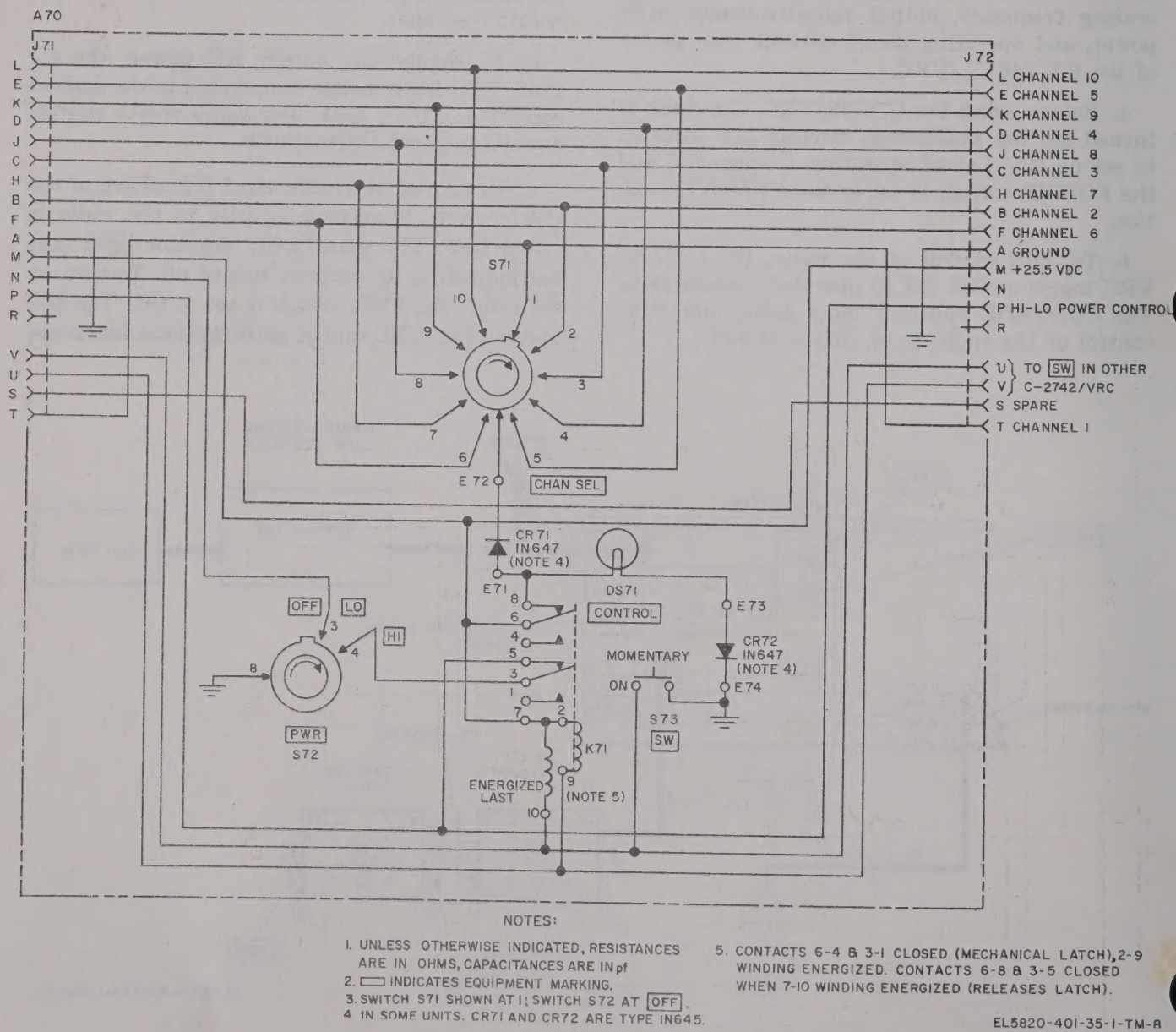


Figure 2-2. Control, Frequency Selector C-2742/VRC, schematic diagram.

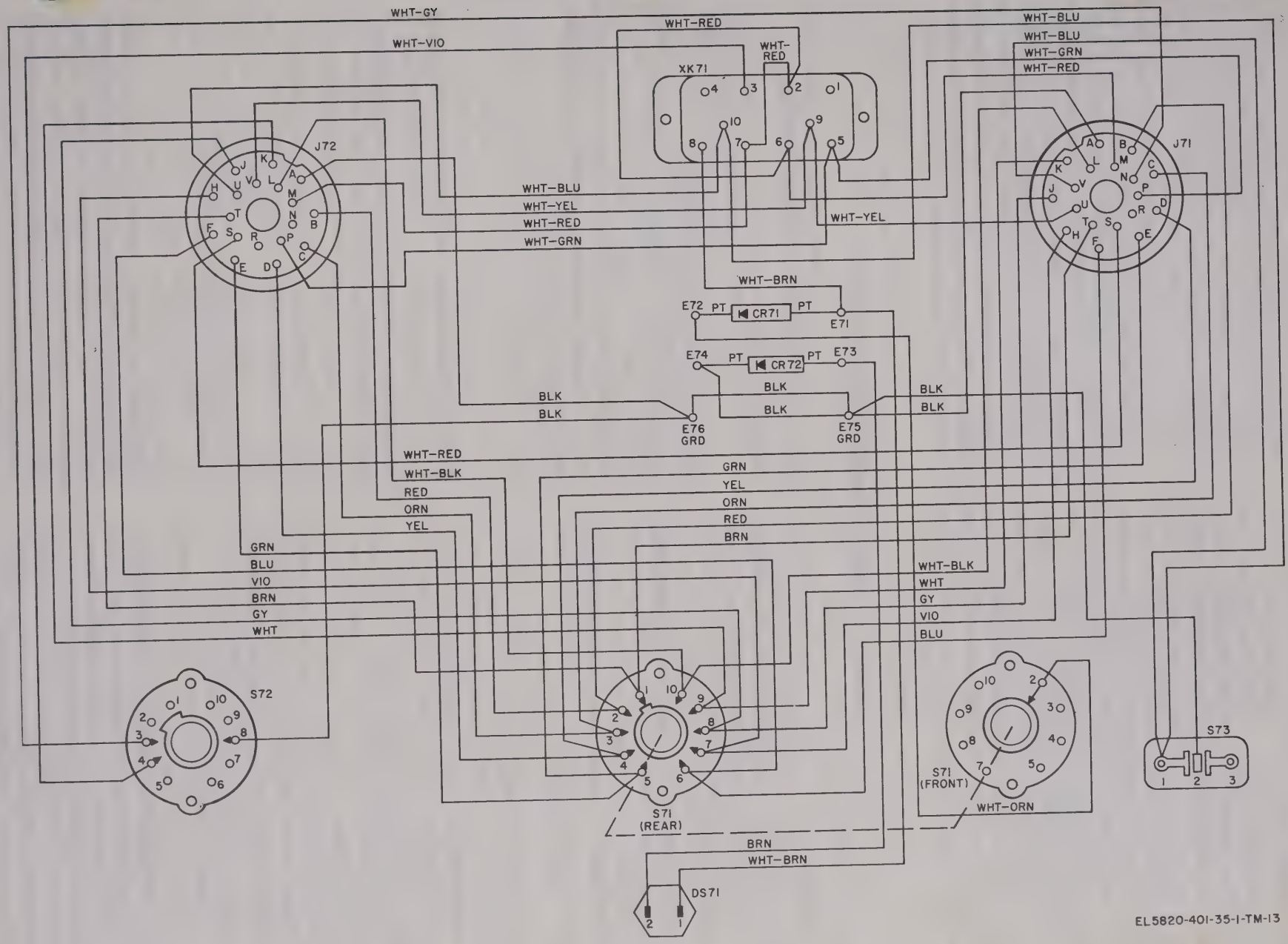


Figure 2–3. Control, Frequency Selector C–2742/VRC, wiring diagram.

ages of the improper polarity from energizing the preset channel relay.

b. Two C-2742/VRC's in System. When two C-2742/VRC's are used in the system, a cable interconnects connector J72 of the first C-2742/VRC with connector J71 of the second C-2742/VRC (fig. 2-1). The second C-2742/VRC can select high power through terminal P of connector J71. It cannot turn power off remotely since terminal N of connector J72 is open. The first C-2742/VRC (connected direct to the RT-246(*)/VRC) functions as described in *a* above. Momentarily operating SW switch S73 at either C-2742/VRC causes both latching relays K71 to operate. The circuit is so arranged that when switch S73 in one C-2742/VRC is operated momentarily, coil 2-9 of K71 in the other C-2742/VRC operates and mechanically locks down contacts 6-8 and 5-3 thus removing power to the CONTROL indicator DS71 and CHAN SEL switch S71. Simultaneously, the same operated S73 operates coil 7-10 of its K71 to release the locking mechanism and allow contacts 6-8 and 5-3 to close and apply power to the CONTROL indicator and CHAN SEL switch. This operation causes control of the RT-246(*)/VRC to be transferred to the C-2742/VRC whose switch was last reported. At the other C-2742/VRC, diode CR72 insures that the energizing voltage applied to relay K71 discharges rapidly. This prevents both relays from being energized at the same time.

Section II. DIRECT SUPPORT MAINTENANCE

2-3. General

The C-2742/VRC is maintained at organizational (TM 11-5820-401-12), direct support, and depot maintenance levels.

a. Repair parts for the C-2742/VRC are listed in appendix B.

b. Facilities for testing the C-2742/VRC are provided in paragraph 2-4.

2-4. Test Equipment and Test Facilities Required

a. Test Equipment and Tools.

(1) Multimeter TS-352B/U (FSN 6625-553-0142; TM 11-6625-366-12).

(2) Toolkit, Electronic Equipment TK-100/G.

b. Test Facilities. Either of the test facilities in (1) or (2) below may be used to check the performance of the C-2742/VRC.

(1) *Radio set facility.*

Item	*Federal stock No.*	*Publication*
Receiver-Transmitter, Radio RT-246(*)/VRC	5820-892-0623	TM 11-5820-401-12
Mounting MT-1029/VRC	5820-893-1323	TM 11-5820-401-12
Wattmeter AN/URM-120	6625-813-8430	TM 11-6625-446-15
Dummy Load, Electrical DA-75/U	6625-177-1637	
Handset H-189/GR	5965-069-8886	TM 11-5965-280-15
Power Supply PP-1104/G	6130-542-6385	TM 11-6130-246-12
Cable Assembly, Power, Electrical CX-4720/VRC (10 ft)	5995-823-2726	SB 11-131
Cable Assembly, Special Purpose, Electrical CX-7059/VRC (5 ft)	5995-823-2865	SB 11-131
Cable Assembly, RF CG-1773/U (1½ ft)	5995-889-0830	SB 11-131
Adapter, Connector UG-201A/U	5935-259-0205	

(2) *Test box facility* (figs. 2-4 and 2-5). A test box facility capable of replacing the RT-246(*)/VRC may be used to check the performance of the C-2742/VRC. It will also be capable of testing the C-2299/VRC, control boxes of the radio-intercom system of some vehicular communication systems, and the RT-246(*)/VRC. Items required to use the test box are listed below. The RT-524(*)/VRC and MT-1029/VRC with the CX-4720/VRC are required in order to apply dc power through the control box to the C-2742/VRC. The adapter cable assembly shown in figure 2-5 is not required to test the C-2742/VRC or C-2299/VRC.

Item	Federal stock No.	Publication
Receiver-Transmitter, Radio RT–524(*)/VRC (1 ea)	5820–892–0622	TM 11–5820–401–12
Mounting MT–1029/VRC (1 ea)	5820–893–1323	TM 11–5820–401–12
Cable Assembly, Power, Electrical CX–4720/VRC (10 ft) (1 ea)	5995–823–2726	SB 11–131
Cable Assembly, Special Purpose, Electrical CX–4723/VRC (5 ft) (2 ea).	5995–823–2833	SB 11–131
Power Supply PP–1104/G (1 ea)	6130–542–6385	TM 11–6130–246–12
Test box (1 ea) fabricated from the following items:		
Metal box; approximately 10 in. wide, 12 in. long, and 2½ in. deep; with a protective cover on the bottom.		
Connector, receptacle, electrical; 18 contacts, female (4 ea)	5935–853–6676	App. C (C–2299/VRC)
Connector, receptacle, electrical; 9 contacts, female (J2 of MX–6707/VRC which is part of Antenna AS–1729/VRC) (1 ea).	5935–892–8895	TM 11–5985–262–15
Relay, Electromagnetic (K501 of AM–1780/VRC) (1 ea)	5945–823–2666	
Socket, relay (for K501) (A4XK501 of AM–1780/VRC) (1 ea)	5935–994–8755	
Indicator assembly (4 ea) consisting of:		
Indicator light	6210–882–3615	
Lamp, incandescent (type MS–25237–327)	6240–155–7836	
Toggle switch, single-pole, three-position (ON–OFF–ON)		

2–5. Test Box Fabrication
(figs. 2–4 and 2–5)

Refer to paragraph 2–4*b*(2) for material required to fabricate the test box.

a. Locate the cable connectors, indicator lamp assemblies, and toggle switch approximately as shown in figure 2–5. Use the items as templates for the required holes. Stencil the panel markings as shown in figure 2–5 and coat the stenciling with clear acrylic lacquer or clear varnish.

b. Wire the components as shown in figure 2–4. The adapter cable assembly is not required to test the C–2742/VRC or C–2299/VRC.

2–6. Performance Check and Troubleshooting C–2742/VRC

Troubleshooting the C–2742/VRC is performed by checking its functions and replacing the parts that impair its performance.

a. Test Setup. Connect the C–2742/VRC either to the RT–246(*)/VRC ((1) below) or to the test box ((2) below).

(1) *Using RT–246(*)/VRC* (fig. 2–1). When the RT–246(*)/VRC will be used to troubleshoot the C–2742/VRC, proceed as follows:

(*a*) Connect the C–2742/VRC to the RT–246(*)/VRC as shown in figure 2–1. The second C–2742/VRC is not required. The required items are listed in paragraph 2–4*b*(1).

(*b*) Turn on the dc power supply and adjust its output to 25.5 volts.

(*c*) Set the C–2742/VRC PWR switch to LO.

(*d*) On the RT–246(*)/VRC, set controls as follows:

1. Set the POWER switch to LOW and the BAND switch to AUTO.

2. Set the pushbutton switches to 10 different frequencies using the instruction on the cover of the pushbutton switches. Select 10 frequencies within 5 megacycles of each other; select five near the top of A band and five near the bottom of B band. Recheck the response of each pushbutton and readjust the tuning mechanism as necessary.

3. Set the RT–246(*)/VRC POWER switch to REMOTE.

(*e*) Set the C–2742/VRC PWR switch to OFF. The RT–246(*)/VRC should be turned off.

(*f*) Proceed to *b* below to troubleshoot and test the performance of the C–2742/VRC.

(2) *Using test box* (fig. 2–5). When the test box will be used to troubleshoot the C–2742/VRC, proceed as follows:

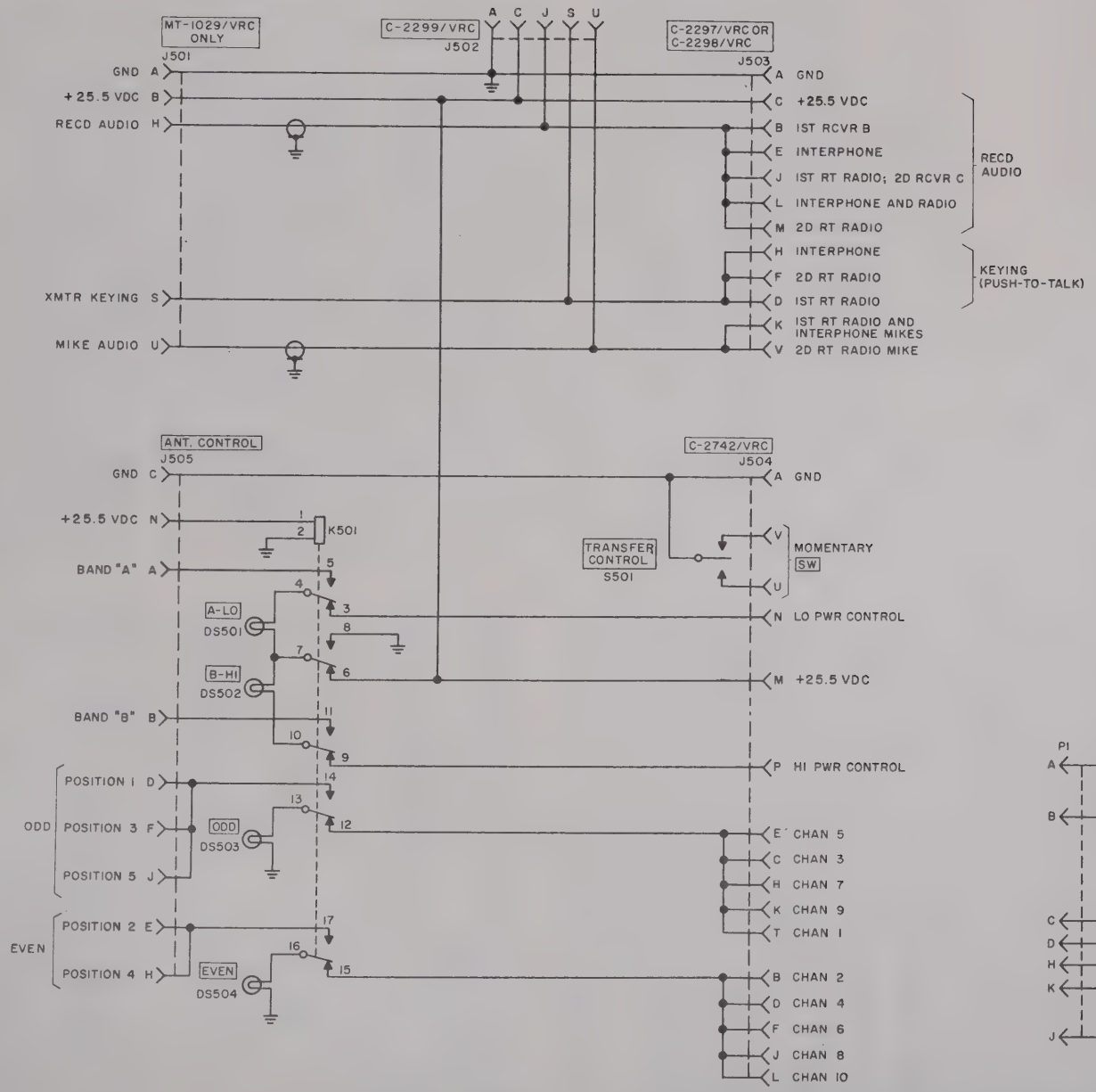
(*a*) Connect the test box to the receiver-transmitter and J71 of C–2742/VRC as shown in figure 2–5. The required items are listed in paragraph 2–4*b*(2). The receiver-transmitter dummy antenna is not required.

(*b*) Turn on and adjust the output of the power supply to 25.5 volts.

(*c*) On the receiver-transmitter, set the POWER switch to LOW (to apply power to the test box; the receiver-transmitter performs no other function in the test setup).

(*d*) Set the C–2742/VRC PWR switch to OFF.

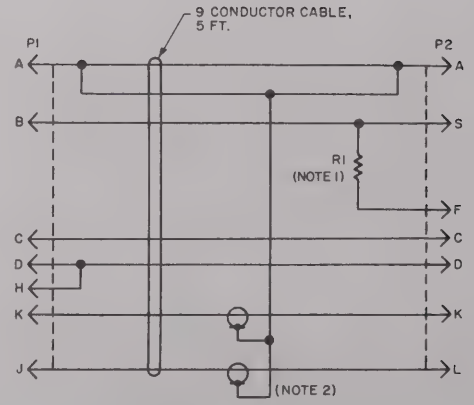
(*e*) Proceed to *c* below to troubleshoot and test the performance of the C–2742/VRC.



A. TEST BOX ASSEMBLY.

NOTES:

1. USE CARE WHEN INSTALLING RESISTOR R1 BETWEEN PINS S & F OF P2 TO MAKE CERTAIN IT DOES NOT SHORT TO THE CENTER POST OF THE CONNECTOR.
2. TIE SHIELDS TOGETHER AND ATTACH TO PIN A OF P1 AND P2.
3. P1 (9-PIN CONNECTOR); P2(18-PIN CONNECTOR).
4. NOT REQUIRED TO TEST C-2742/VRC OR C-2299/VRC.



B. ADAPTER CABLE ASSEMBLY. (NOTE 4)

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Figure 2-4. Wiring diagram of test box and adapter cable assembly.

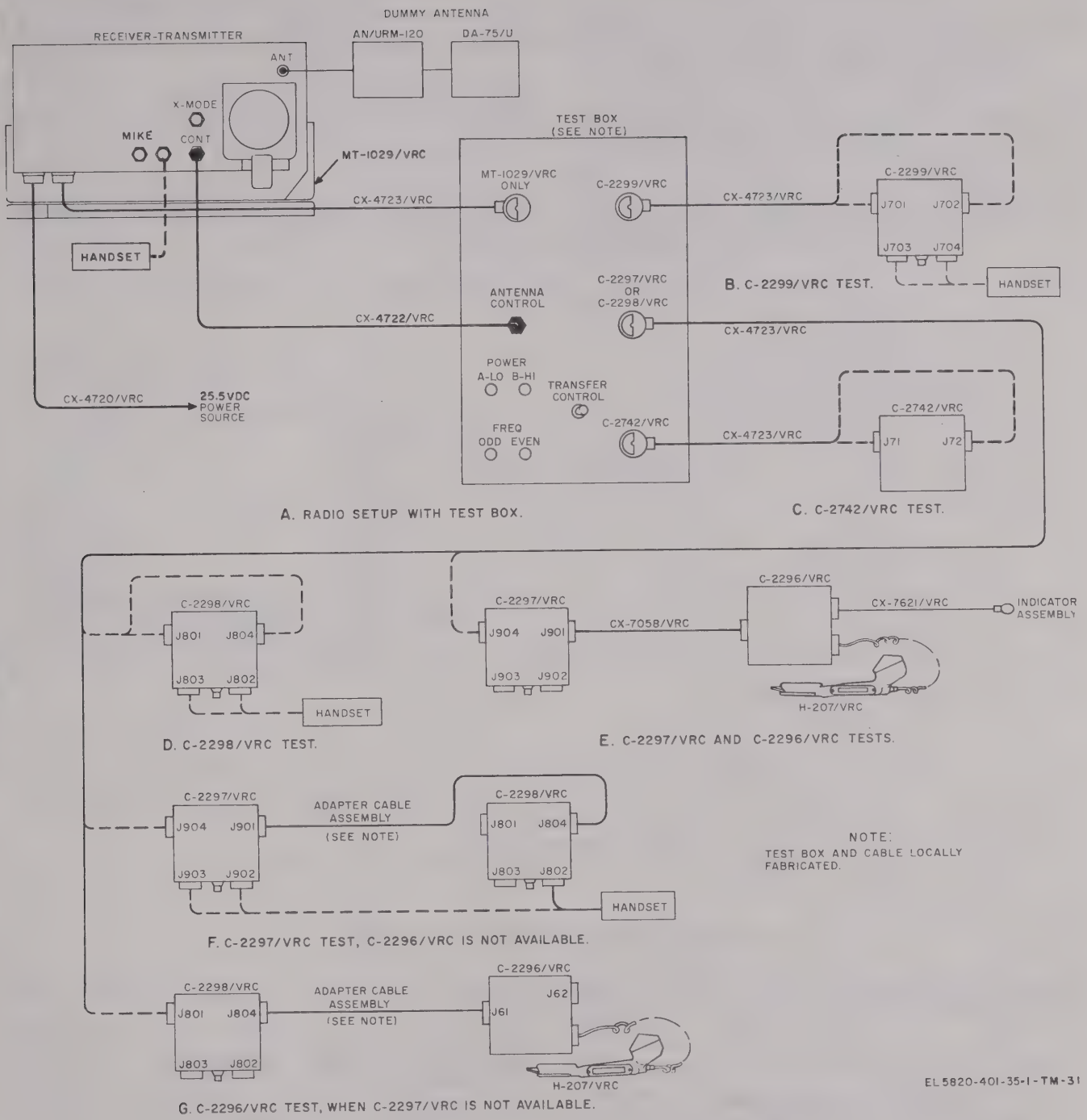


Figure 2–5. Test setup for C–2742/VRC and C–2299/VRC, using test box.

b. Performance Check and Troubleshooting C–2742/VRC Using RT–246(*)/VRC (fig. 2–1). Connect the equipment as explained in *a*(1) above. Perform the operations in the sequence given and the indicated corrective measures when the normal indications are not obtained. Relay K71 replacement procedures are given in paragraph 2–7*b*.

Action	Normal indication	Corrective measure
1 Operate C–2742/VRC PWR switch LO. If CONTROL indicator does not light, momentarily operate toggle switch SW.	The C–2742/VRC CONTROL indicator should light and radio should be turned on.	If radio is turned on, replace indicator lamp DS71 and relay K71, in turn. If radio is not turned on, higher maintenance level repair is required.

Action	Normal indication	Corrective measure
2 Using the handset, key the RT-246(*)/VRC and observe the indication on the AN/URM-120.	The AN/URM-120 should indicate low output power.	Higher maintenance level repair is required.
3 Operate C-2742/VRC PWR switch to HI, key the RT-246(*)/VRC, and observe the indication on the AN/URM-120.	The AN/URM-120 should indicate high output power.	Replace relay K71.
4 Operate C-2742/VRC PWR switch to OFF. Reset to LO after test.	The C-2742/VRC CONTROL indicator should go out and RT-246(*)/VRC should be turned off.	Higher maintenance level repair required.
5 Set C-2742/VRC CHAN SEL switch to each position, in turn. Wait for each selected channel to appear on the RT-246(*)/VRC before changing the switch to the next position.	Each selected channel should appear on the RT-246(*)/VRC.	Higher maintenance level repair required.
6 Momentarily connect a jumper wire between pins V and A (ground) of connector J72.	The C-2742/VRC CONTROL indicator should go out (indicating relay K71 is locked operated).	Replace relay K71.
7 Momentarily operate toggle switch SW.	The C-2742/VRC CONTROL indicator should light.	Replace relay K71.

c. Performance Check and Troubleshooting C-2742/VRC Using Test Box (fig. 2-5). Connect the equipment as explained in *a*(2) above. Perform the operations given in the following chart and the indicated corrective measures when the normal indication is not obtained. Relay K71 replacement procedures are given in paragraph 2-7*b*.

Action	Normal indication	Corrective measure
1 Operate receiver-transmitter POWER switch to ON. Operate C-2742/VRC PWR switch to LO. If CONTROL indicator on C-2742/VRC does not light, momentarily operate toggle switch SW.	The C-2742/VRC CONTROL indicator should light. On the test box, A-LO indicator should light.	Replace CONTROL indicator lamp DS71 and relay K71, in turn.
2 Operate C-2742/VRC PWR switch to HI.	On the test box, B-HI indicator should light.	Replace relay K71.
3 Momentarily operate the test box TRANSFER control switch to the left.	The C-2742/VRC CONTROL indicator should go out.	Replace relay K71.
4 Momentarily operate C-2742/VRC toggle switch SW.	The C-2742/VRC CONTROL indicator should light.	Replace relay K71.
5 Operate C-2742/VRC CHAN SEL switch to each position, in turn.	The test box ODD indicator should light on positions 1, 3, 5, 7, and 9. The test box EVEN indicator should light on positions 2, 4, 6, 8, and 10.	Higher maintenance level repair rerequired.
6 Remove connection of CX-4723/VRC from J71 of C-2742/VRC and connect to J72.	On the test box, B-HI indicator should light.	Replace relay K71.
7 Momentarily operate test box TRANSFER CONTROL switch to right.	The C-2742/VRC CONTROL indicator should go out and test box B-HI indicator should go out.	Replace relay K71.
8 Repeat procedures in steps 4 and 5 above.	Same indications as given in steps 4 and 5 above.	Same measures as given in steps 4 and 5 above.

2–7. Repair of C–2742/VRC

Repair parts for the C–2742/VRC are listed in appendix B.

a. Replace front panel control knobs and CONTROL indicator lamp DS71 as required. Tighten the locknuts holding the knobs and receptacles.

b. To replace relay K71 (B, fig. 2–6), remove the back cover from the box. Unscrew the captive screws holding the relay and remove the relay. Carefully position the replacement relay pins in line with the relay receptacle, press the relay in place and tighten the captive screws.

c. Inspect the parts inside the box for loose parts and damaged wiring; tighten all screws and nuts. Before replacing the back cover, apply a light coating of insulating silicon compound (FSN 6850–880–7616), or equal, to the preformed packing in the back cover. Replace the back cover and tighten the captive screws.

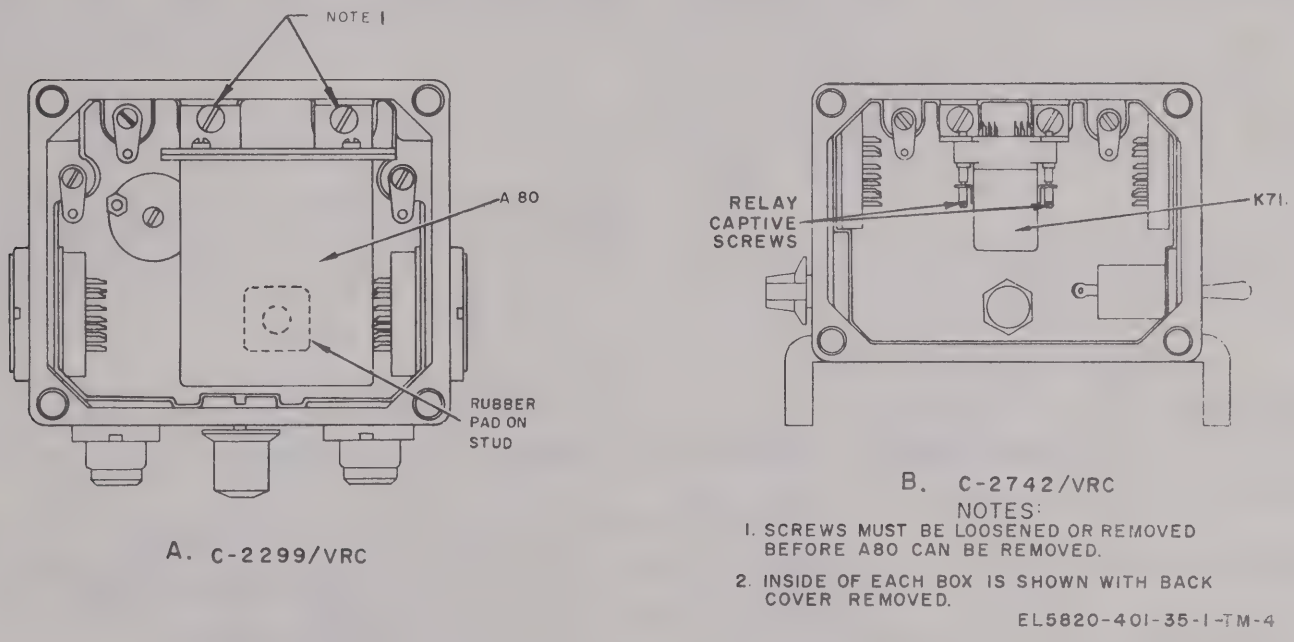


Figure 2–6. Internal views of C–2299/VRC and C–2742/VRC.

Section III. DEPOT MAINTENANCE

2–8. General

Maintenance of the C–2742/VRC at depot level facilities includes complete repair of the unit and overhaul as required. It also includes checking the performance of the repaired equipment for conformance with the depot overhaul standards.

2–9. Test Equipment and Test Facilities Required

a. Test Equipment.

(1) Multimeter TS–325B/U.

(2) Power Supply PP–1104/G.

b. Test Facility. To facilitate connection to C–2742/VRC circuits through connectors J71 and J72, fabricate two test cables No. 3 as shown in figure 2–7. Use a male connector (FSN 5935–815–2325) from Cable Assembly, Special Purpose, Electrical CX–4723/VRC.

2–10. Troubleshooting and Repair

a. Troubleshooting.

(1) To test the C–2742/VRC before troubleshooting and after repair, use procedures given in paragraph 2–11.

(2) Use TS–352B/U to make resistance and continuity measurements of C–2742/VRC (figs. 2–2 and 2–3). Following are typical resistance values (±10 percent) of resistive circuits.

(*a*) Between pin M of J71 or J72 and ground, measure 110 ohms (DS71 and CR72).

(*b*) Between pin M of J72 and either U

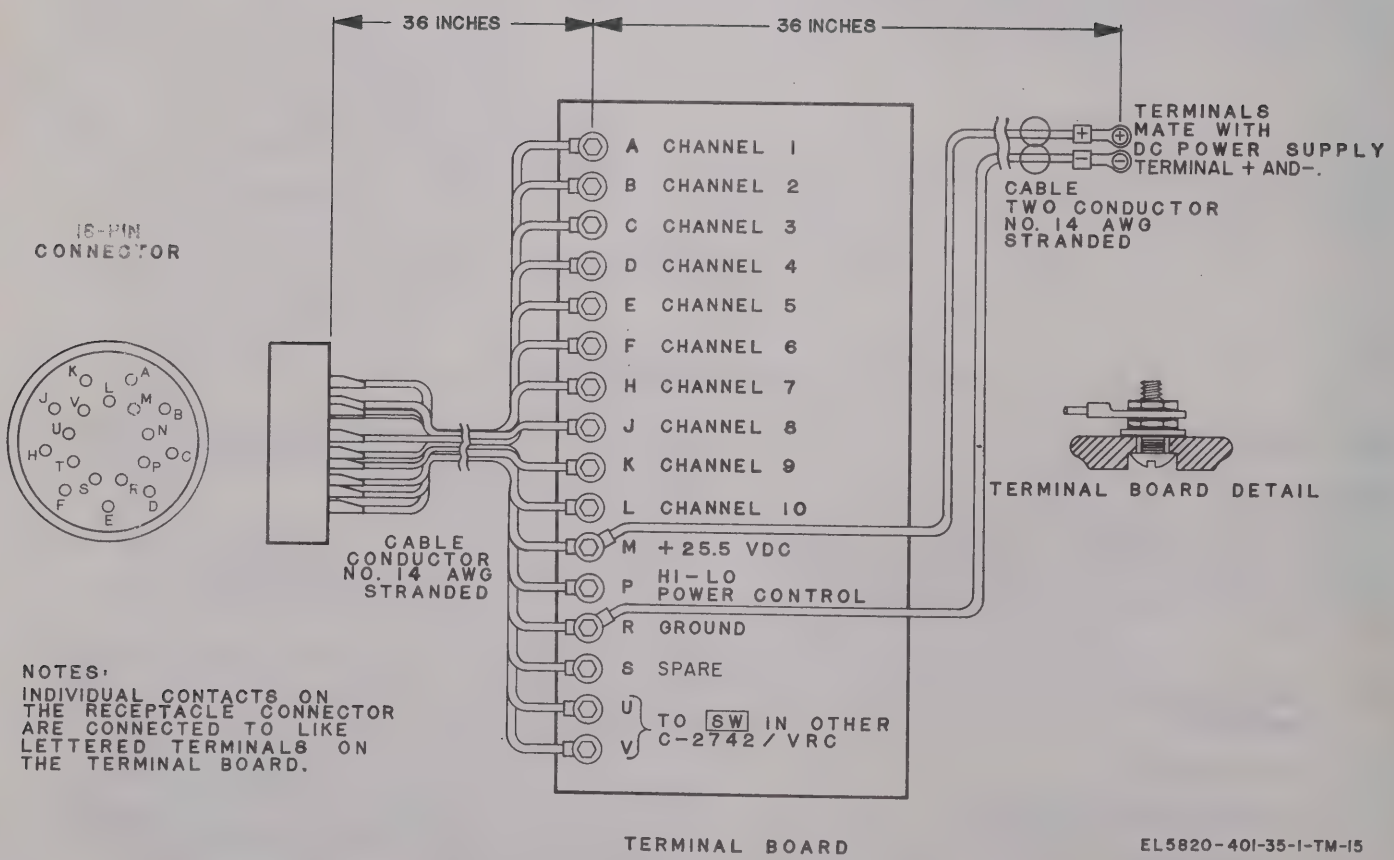


Figure 2–7. Fabrication details for test cable No. 3 for use with CX–2742/VRC.

or V of J71, measure 1,110 ohms (single winding of K71).

(*c*) Between pin U of J71 and pin U of J72, measure 2,200 ohms (both windings of K71).

b. Repair. Repair parts for the C–2742/VRC and parts location illustrations are provided in appendix B. Replacement of relay K71 is discussed in paragraph 2–7. After replacement of a part, make sure that the mounting screws and locknuts are tightened securely. Before replacing the back cover, apply a light coating of insulating silicon compound (FSN 6850–880–7616), or equal, to the preformed packing in the cover.

2–11. Depot Overhaul Standards—Performance Tests

The tests on repaired equipment are designed to measure the performance capability of the equipment. Equipment that is returned to stock should meet the standards given in the tests.

NOTE

The depot overhaul standards (*c* below) should not be used to test the performance of *new* equipment; that is, equipment that has not been repaired or rebuilt. Such equipment should be tested for conformance with the electrical and operational tests cited in MIL–C–55127(EL) under which the equipment was manufactured including any waivers and/or changes to the specification which were imposed upon or granted to the particular manufacturer of the equipment. For such information, address correspondence to Commander, US Army Electronics Command, ATTN: AMSEL–PE–EC, Fort Monmouth, N.J. 07703.

a. Applicable References.

(1) *Repair standards.* Applicable procedures of the depots performing the tests and general standards for repaired electronic equipment given in TB SIG 355–1, TB SIG 355–2, and TB SIG 355–3 form a part of the requirement for testing the C–2742/VRC.

(2) *Modification work orders.* Perform all modification work orders (MWO's) applicable to the C–2742/VRC before making the tests of the C–2742/VRC. DA Pam 310–7 lists all current MWO's.

b. Test Equipment and Test Cables Required. The required items are given in paragraph 2–9.

c. Depot Overhaul Standards.

(1) *Test setup* (figs. 2–7 and 2–8).

(*a*) Connect one test cable No. 3 to J1 and another test cable No. 3 to J2 of C–2742/VRC.

(*b*) Connect the PP–1104/G to terminals M (+) and A (−) of test cable No. 3 connected to J71.

(*c*) Adjust the output of the power supply to 25.5 volts.

(2) *Procedure.* Perform the operations in the sequence given in the following chart. The required performance standards are indicated.

Step No.	Action	Performance standard
1	Operate C–2742/VRC toggle switch SW momentarily	CONTROL indicator should light.
2	*a.* Adjust TS–352B/U to measure 50 volts dc and connect the negative lead to terminal A (ground) of connector J72.	*a.* None.
	b. Rotate C–2742/VRC CHAN SEL switch to each position in turn. At each position, connect TS–352B/U positive lead to following pins of each test cable: *CHAN SEL switch position* — *J1 and J2 pins* 1 — T 2 through 10 — B through L	*b.* At each indicated position of CHAN SEL switch, power supply voltage should be obtained at associated test cable terminal.
3	Adjust TS–352B/U to measure resistance (RX1). Connect the test leads between pins S (spare) of J71 and J72.	TS–352B/U should indicate continuity (0 ohm).
4	Connect one test lead between pin A of J71 and other test lead as indicated in steps 5, 6, and 7.	None.
5	Connect TS–352B/U to pin N of J1. Set C–2742/VRC PWR switch to OFF.	TS–352B/U should indicate infinity (open).
6	Set PWR switch to LO	TS–352B/U should indicate continuity (0 ohm).
7	Set PWR switch to HI and connect TS–352B/U to pin P of J1 and J2, in turn.	TS–352B/U should indicate continuity.

Step No.	Action	Performance standard
8	Connect a jumper wire momentarily between pins A and V of J72.	C–2742/VRC CONTROL indicator should go out.
9	Operate C–2742/VRC toggle switch SW momentarily ------	CONTROL indicator should light.
10	Connect a jumper wire momentarily between pin A and, in turn, pins V and U of J72.	CONTROL indicator should go out at pin V and on again at pin U.
11	Connect a jumper wire momentarily between pin A and, in turn, pins U and V of J71.	CONTROL indicator should go out at pin U and on again at pin V.

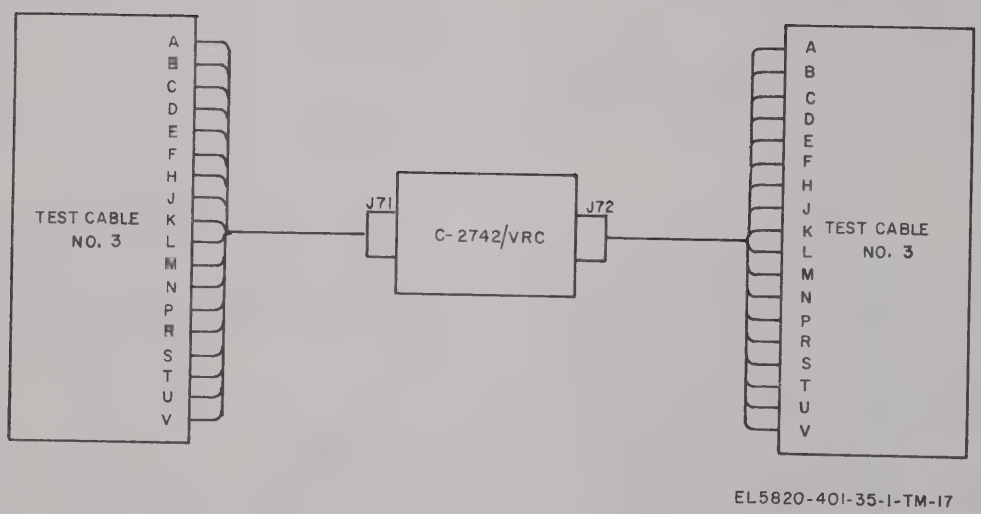


Figure 2–8. Connection of test cables No. 3 to C–2742/VRC.

CHAPTER 3

CONTROL, RADIO SET C–2299/VRC

Section I. CIRCUIT FUNCTIONING

3–1. System Application of C–2299/VRC (fig. 3–1)

The C–2299/VRC is used between receiver-transmitters of Radio Sets AN/VRC–49 and AN/VRC–45 to provide automatic retransmission of signals between radio sets that are too far apart to communicate directly with each other.

a. Receiver-Transmitter No. 1 and terminal radio No. 2 operate on one frequency (F1), and receiver-transmitter No. 2 and terminal radio No. 4 operate on another frequency (F2). For retransmission operation, the radios in the system must operate on squelch mode.

b. When the C–2299/VRC RETRANS switch is set to ON, the retransmission of signals and keying control are automatically passed through the C–2299/VRC to the retransmission site receiver-transmitters. When the C–2299/VRC RETRANS switch is set to OFF, the user has control of the two receiver-transmitters from the audio accessories connected to the C–2299/VRC. In position 1 of RAD TRANS switch, receiver-transmitter No. 1 is controlled; in position 2 of RAD TRANS switch, receiver-transmitter No. 2 is controlled.

c. Audio accessories can be connected to the C–2299/VRC to enable the radio user to communicate through the retransmission site receiver-transmitters with the terminal radios. When the C–2299/VRC RETRANS switch is set to ON, the radio user cannot communicate with the terminal radios, but can hear the transmission occurring between the terminal radios.

d. However, when the C–2299/VRC is connected to the AM–1780/VRC of the radio-intercom system the receiving circuits of the receiver-transmitters No. 1 and 2 are not available at the C–2299/VRC. Thus, radio communication is conducted from the crewmember control boxes. Also, for the retransmission operation, the INSTALLATION switch of the AM–1780/VRC is set to RETRANS position. Under these conditions, the retransmission signals are available on the ALL position of the crewmember control boxes.

3–2. Control, Radio Set C–2299/VRC, Circuit Functioning (fig. 3–2)

In the following discussion, the first receiver-transmitter is identified as receiver-transmitter No. 1 in figure 3–1 and the second receiver-transmitter is identified as receiver-transmitter No. 2 in figure 3–1. Connections from the C–2299/VRC are made direct to the radio mounts MT–1029/VRC or through the AM–1780/VRC to the radio mounts. Figure 3–3 is wiring diagram of C–2299/VRC.

a. When RETRANS switch W701S702 is in OFF position, remote control of the receiver-transmitters from the C–2299/VRC is possible. Resistors R702 and R703 terminate the receiver-transmitters monitor amplifier output when RETRANS switch W701S702 is in OFF position to provide the same output impedance for the amplifiers as when the switch is in ON position. When RETRANS switch W701S701 is in OFF position, RAD TRANS switch W701S701 selects the receiver-transmitter to be controlled. Position 1 selects the receiver-transmitter connected to W701J701; position 2 selects the receiver-transmitter connected to W701J702.

(1) When RAD TRANS switch W701S701 is at position 1, muted audio from the first receiver-transmitter is fed from terminal J of W701J701, through switch W701S701 and VOLUME control R701, to terminals B and E of audio accessory connectors W701J703 and W701J704, respectively. When W701S702 is in OFF position, a push-to-talk switch of an audio accessory connected to W701J703 or W701J704 can control the first receiver-transmitter keying relay through terminal C of the connectors, switch W701S701, and terminals S and L of connector W701J701. After the

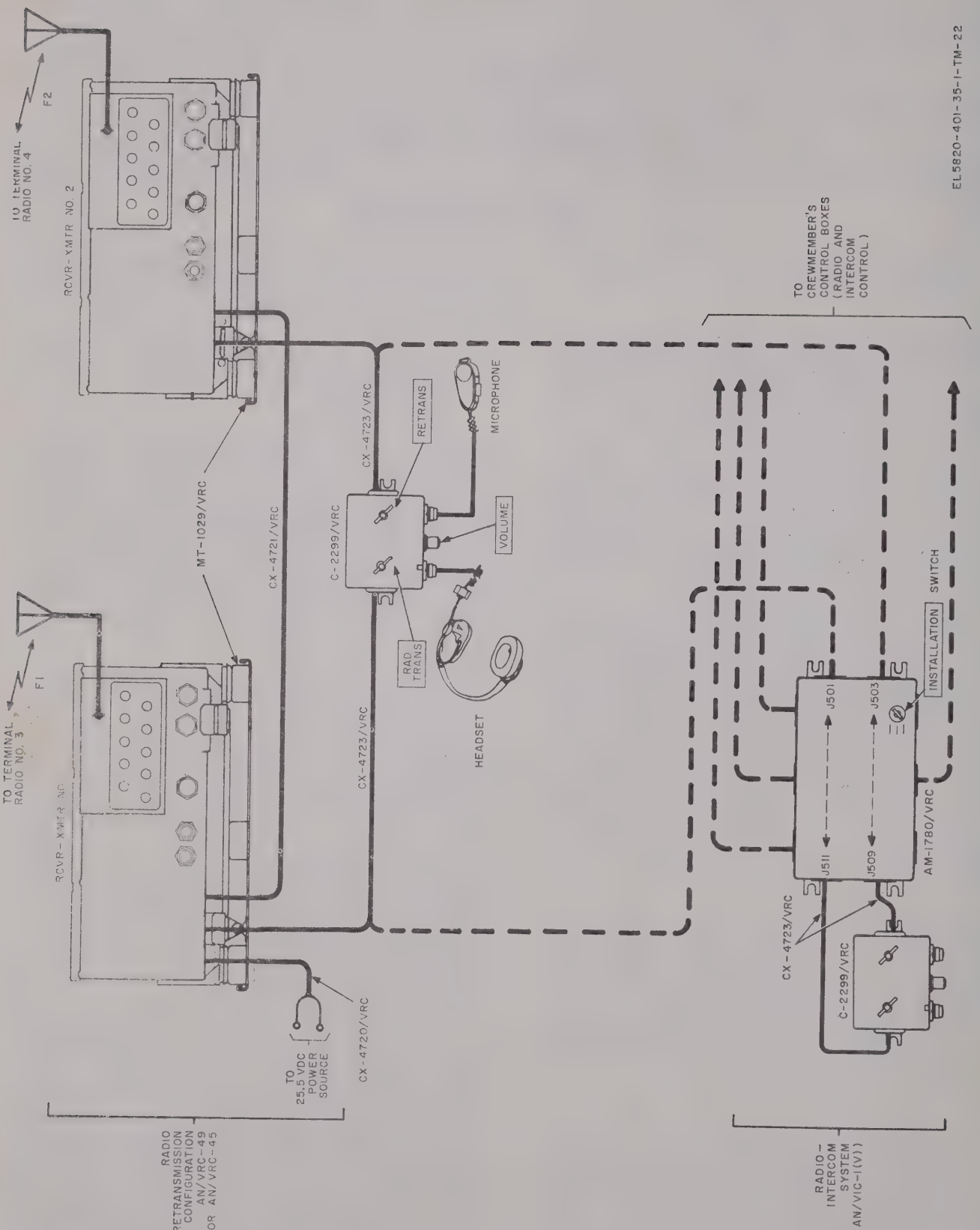
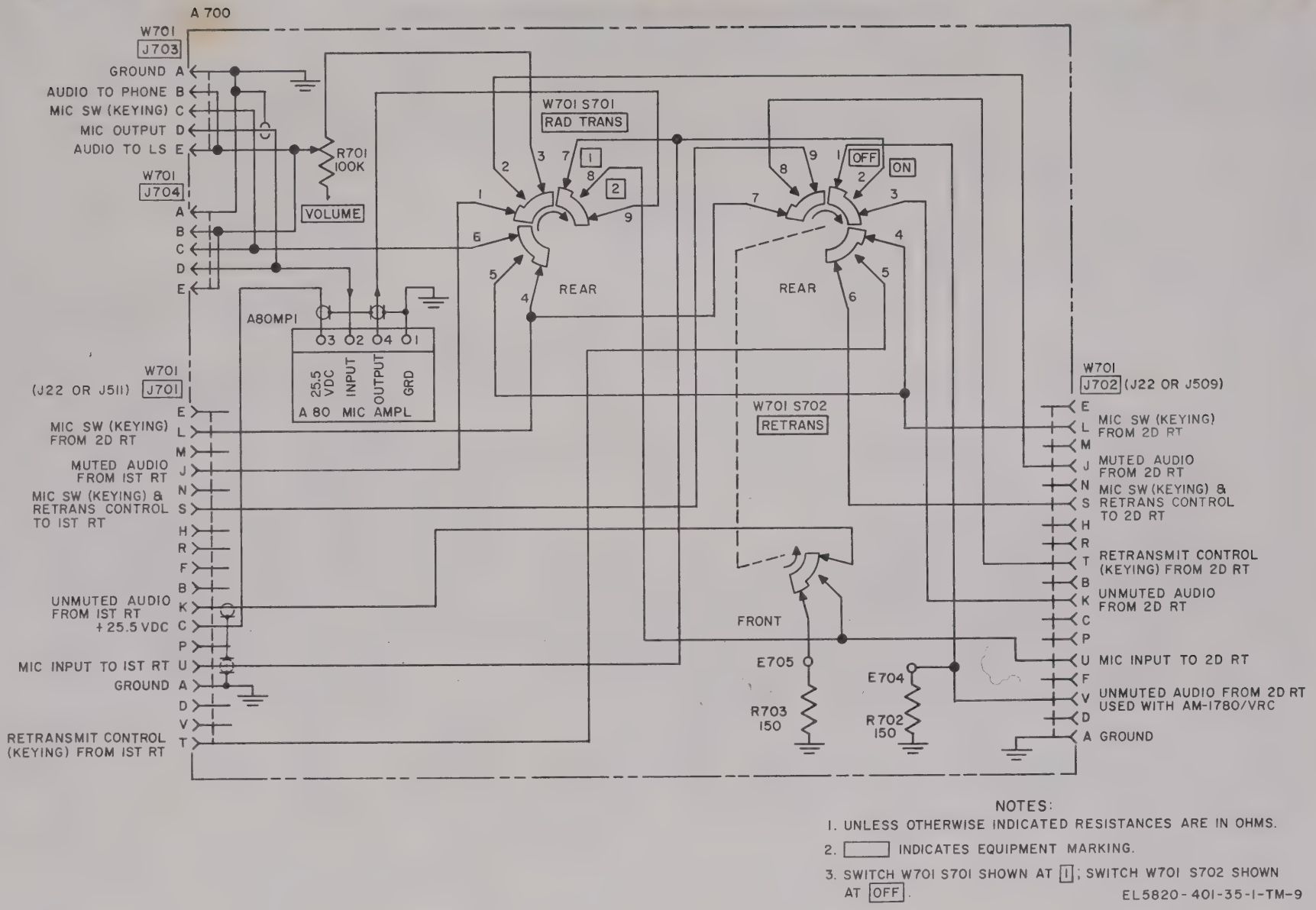


Figure 3-1. System application of C-2299/VRC.



NOTES:

1. UNLESS OTHERWISE INDICATED RESISTANCES ARE IN OHMS.
2. [ ] INDICATES EQUIPMENT MARKING.
3. SWITCH W701 S701 SHOWN AT [1]; SWITCH W701 S702 SHOWN AT [OFF].

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Figure 3–2. Control, Radio Set C–2299/VRC, schematic diagram.

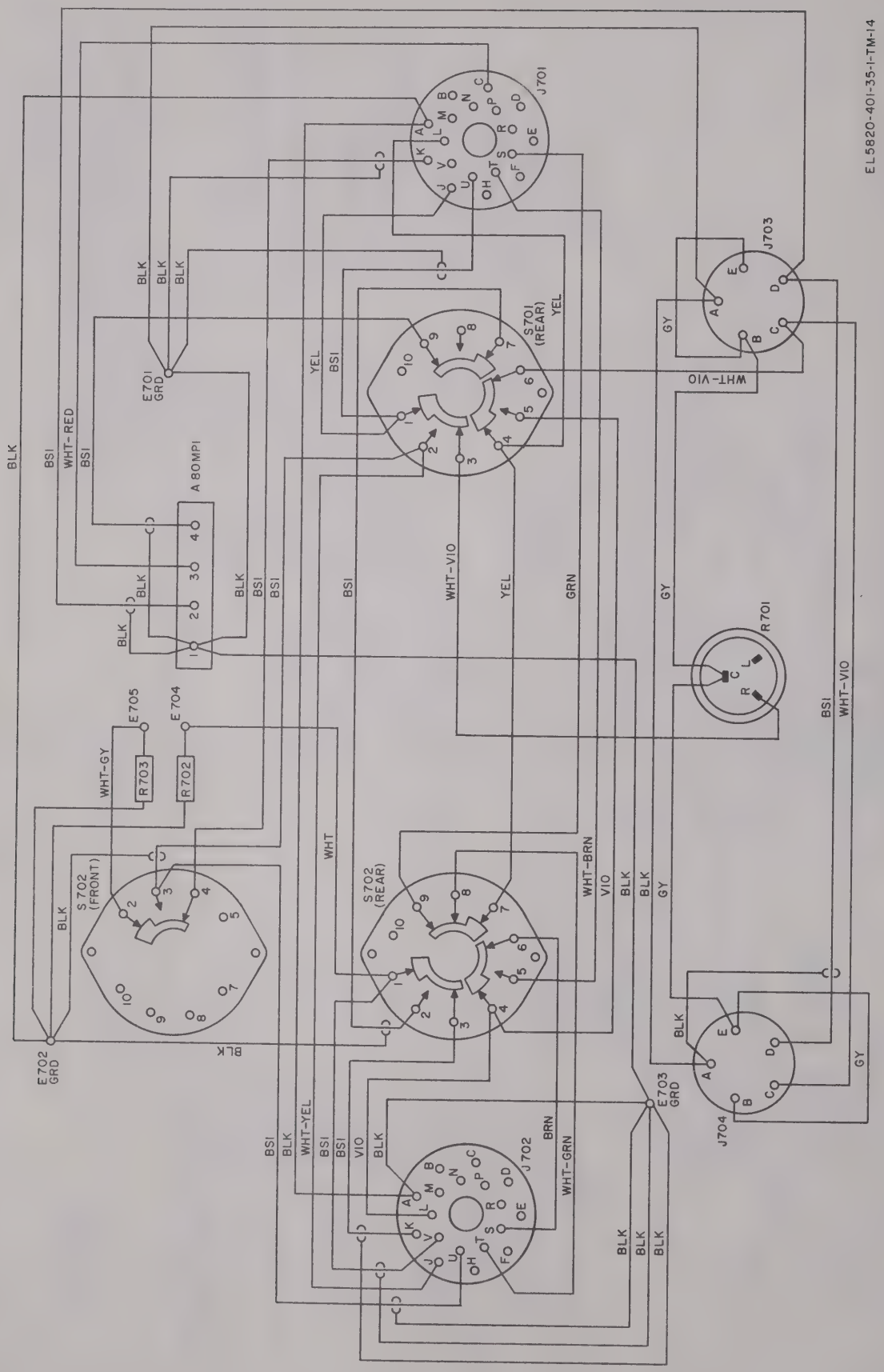


Figure 3-3. Control, Radio Set C-2299/VRC, wiring diagram.

microphone output of the audio accessory has been amplified in microphone amplifier A80 (para 3–3), it is applied through switch W701S701 and terminal U of connector W701J701 to the transmitting circuits of the receiver-transmitter.

(2) When RAD TRANS switch W701S701 is at position 2, muted audio from the second receiver-transmitter is fed from terminal J of W701J702 through the same circuit as given in (1) above. The audio accessory will control the second receiver-transmitter connected to W701-J702 through the same circuits described in (1) above.

b. When RETRANS switch W701S702 is in ON position, the monitor amplifier output of the first receiver-transmitter is fed to the microphone line of the second receiver-transmitter from terminal K of W701J701 and terminal U of connector W701J702. Similarly, the monitor amplifier output of the second receiver-transmitter is fed to the microphone line of the first receiver-transmitter from terminal K of W701J702 to terminal U of W701J701. When a keying signal is received (by operation of squelch and retransmit relays) by the first receiver-transmitter, the second receiver-transmitter will be keyed through a circuit from terminal T of W701J701 through W701S702, to terminals S of W701J702. Similarly, when a keying signal is received by the second receiver-transmitter, the first receiver-transmitter is keyed through a circuit from terminal T of W701J702, through W701S702, to terminal S of W701S701. An operator can listen to either of the channels being used for retransmission but cannot key either transmitter. However, he can modulate the keyed transmitter depending on the position of RAD TRANS switch W701S701. Similarly, when the C–2299/VRC is connected to the AM–1780/VRC (fig. 3–1), crewmembers cannot key the receiver-transmitters because the INSTALLATION switch on the AM–1780/VRC is set to RETRANS position which opens the keying control lines.

3–3. Microphone Amplifier Assembly A80, Circuit Functioning (fig. 3–4)

Microphone amplifier assembly A80 is a three-stage, direct-coupled amplifier used in the C–2299/VRC (fig. 3–2) and also in control boxes of Intercommunication Set AN/VIC–1(V) (TM 11–5830–340–12): C–2296/VRC, C–2297/VRC, and C–2298/VRC. The A80 receives its input signal from the dynamic microphone connected to the control box. Its output is fed to the speech amplifier of the receiver-transmitters or to the interphone amplifier of the AM–1780/VRC.

a. The input from the dynamic microphone is fed through an RF filter network composed of capacitors C81 and C82 and inductor L81; through impedance-matching resistor R81 and coupling capacitor C83 to the base of transistor

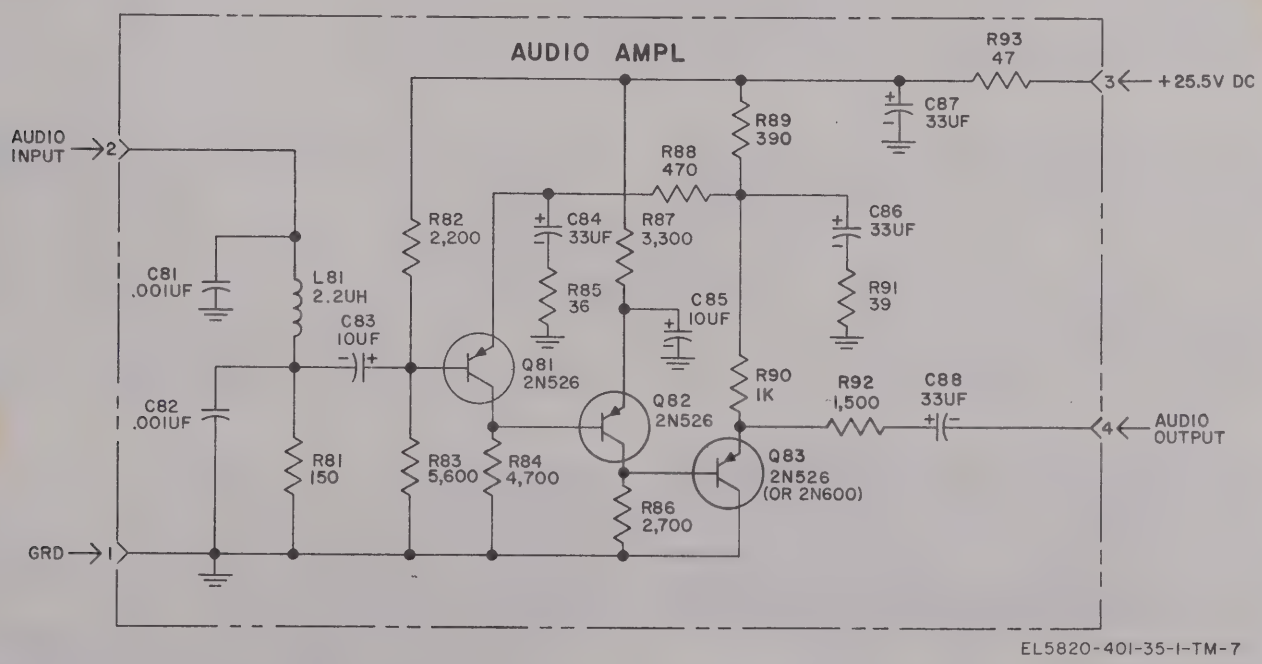


Figure 3–4. Microphone amplifier assembly A80, schematic diagram.

Q81. The amplified output of transistor Q81 is direct-coupled to the base of transistor Q82 which, in turn, applies the signal to the base of transistor Q83. Resistor R92 reduces the level of the signal from transistor Q83. Capacitor C88 is a coupling capacitor.

b. The dc voltage for the A80 is fed from the 25.5-volt dc power supply through filter network consisting of resistor R93 and capacitor C87. Resistors R82 and R83 set the base voltage on transistor Q81. Resistors R84 and R86 are load resistors for transistors Q81 and Q82, respectively. Resistors R87, R98, and R90 are bias resistors for transistors Q82 and Q83. Capacitor C85 is a high audiofrequency bypass capacitor.

c. The microphone amplifier uses degenerative ac and dc feedback to stabilize the operation of the transistors. Capacitors C84 and C86 and resistors R85, R88, and R91 form the ac feedback circuit. Resistor R88 is the principle component of the dc feedback circuit from the emitter of transistor Q83 to the emitter of transistor Q81.

Section II. DIRECT SUPPORT MAINTENANCE

3–4. General

The C–2299/VRC is maintained at organizational (TM 11–5820–401–12), direct support, and depot maintenance levels. Repair parts for the C–2299/VRC are listed in appendix C.

3–5. Test Equipment and Test Facilities Required

a. Test Equipment and Tools.

Item	*Federal stock No.*	*Publication*
Receiver-Transmitter, Radio RT–246(*)/VRC (1 ea)	5820–892–0623	TM 11–5820–401–12
or		
Receiver-Transmitter, Radio RT–524/*)/VRC (1 ea)	5820–892–0622	TM 11–5820–401–12
Mounting MT–1029/VRC (2 ea)	5820–893–1323	TM 11–5820–401–12
Microphone, Dynamic M–80/U, or equal	5965–179–7762	
Headset, Electrical H–140A/U, or equal	5965–892–1010	TM 11–5965–260–15P
Cable Assembly, Power, Electrical CX–4720/VRC (10 ft) (1 ea)	5995–823–2726	SB 11–131
Cable Assembly, Power, Electrical CX–4721/VRC (4 ft) (1 ea)	5995–823–2913	SB 11–131
Cable Assembly, Special Purpose, Electrical CX–4723/VRC (5 ft) (2 ea).	5995–823–2833	SB 11–131

(1) Multimeter TS–352B/U.

(2) Toolkit, Electronic Equipment TK–100/G.

b. Test Facilities. Either test facility in (1) or (2) below may be used to check the performance of the C–2299/VRC.

(1) *Radio set facility.*

(2) *Test box facility* (figs. 2–4 and 2–5). To use the test box to test the C–2299/VRC, refer to paragraph 2–4*b*(2) for the required items and to paragraph 2–5 to fabricate the test box. In addition, the following dummy antenna items are required.

Item	*Federal stock No.*	*Publication*
Wattmeter AN/URM–120 (1 ea)	6625–813–8430	TM 11–6625–446–15
Dummy Load, Electrical DA–75/U (1 ea)	6625–177–1639	
Cable Assembly, RF CG–1773/U (1½ ft) (1 ea)	5995–889–0830	SB 11–131
Adapter, Connector UG–201A/U (1 ea)	5935–259–0205	

3–6. Performance Check and Troubleshooting C–2299/VRC

Use the procedures in *b* or *c* below to troubleshoot and check the performance of the C–2299/VRC. Set up the equipment as explained in *a*(1) or (2) below.

a. Test Setup. Connect the C–2299/VRC either to the radio sets ((1) below) or to the test box ((2) below).

(1) *Using radio sets* (fig. 3–1). When the radio sets will be used to troubleshoot the C–2299/VRC, proceed as follows.

(*a*) Connect the C–2299/VRC to the radio sets as shown in figure 3–1. The required items are listed in paragraph 3–5*b*(1).

(*b*) Turn on the power supply and adjust its output to 25.5 volts.

(*c*) Set the C–2299/VRC RAD TRANS switch to OFF.

(*d*) Arrange for the retransmission site radios to operate on two frequencies (F1 and F2) at least 10 MHz apart and to operate in satisfactory squelch mode between the terminal radios and each retransmission site radio.

(*e*) Connect the audio accessories to the C–2299/VRC.

(*f*) Proceed to *b* below to troubleshoot and test the performance of the C–2299/VRC.

(2) *Using test box* (fig. 2–5). When the test box will be used to troubleshoot the C–2299/VRC, proceed as follows:

(*a*) Connect the test box to the receiver-transmitter and J701 of C–2299/VRC as shown in figure 2–5. The required items are listed in paragraph 3–5*b*(2).

(*b*) Turn on adjust the output of the power supply to 25.5 volts.

(*c*) Turn on the receiver-transmitter and adjust it to operate on any convenient frequency. Note the AN/URM–120 indication for low output power transmission.

(*d*) Proceed to *c* below to troubleshoot and test the performance of the C–2299/VRC.

b. Performance Check and Troubleshooting C–2299/VRC Using Retransmission Radio Sets (fig. 3–1). Connect the equipment and adjust the retransmission site radios as explained in *a*(1) above. Perform the operations in the sequence given below and the indicated corrective measures when normal indications are not obtained.

	Action	Normal indication	Corrective measure
1	Set C–2299/VRC RETRANS switch to OFF. Adjust VOLUME controls of receiver-transmitters to midposition.	None	None.
2	Set C–2299/VRC RAD TRANS switch to position 1. Communicate with terminal radio, using microphone. Adjust C–2299/VRC VOLUME control as required during radio reception.	Receiver-transmitter No. 1 is keyed and sidetone of transmission is heard on loudspeaker of receiver-transmitter and on headset. VOLUME control regulates level of signal smoothly.	If sidetone is not heard on receiver-transmitter loudspeaker, replace C–2299/VRC microphone amplifier module A80 (para 3–7*b*). If receiver-transmitter is not keyed or sidetone is not heard on C–2299/VRC headset, higher maintenance level repair required.
3	Set C–2299/VRC RAD TRANS switch to position 2. Repeat operations given in step 2 above.	Same indications given in step No. 2 above, except receiver-transmitter No. 2 is keyed.	Higher maintenance level repair required.
4	Set C–2299/VRC RETRANS switch to ON. Set RAD TRANS switch to positions 1 and 2, in turn. At each position, operate microphone switch to key each radio.	Radios should not respond to keying operation.	Higher maintenance level repair required.
5	Reset RETRANS switch to OFF	None	None.
6	Communicate with each terminal radio, in turn (steps 2 and 3 above), and advise them to communicate directly with each other through the retransmission site radios; then set C–2299/VRC RETRANS switch to ON.	Communication proceeds automatically through retransmission site radios from each terminal radio.	Higher maintenance level repair required.

c. Performance Check and Troubleshooting C–2299/VRC Using Test Box (fig. 2–5). Connect the equipment as explained in *a*(2) above. Perform the operations given in the following chart and the indicated corrective measures when the normal indication is not obtained:

	Action	Normal indication	Corrective measure
1	Set C–2299/VRC RETRANS switch to OFF. Adjust VOLUME control of receiver-transmitter to midposition.	None	None.

Action	Normal indication	Corrective measure
2 Connect handset to J703 of C–2299/VRC; set RAD TRANS switch to position 1.	Receiver-transmitter should be keyed (AN/URM–120 should indicate low power).	If sidetone is not heard on receiver-transmitter loudspeaker, replace microphone amplifier module A80 (para 3–7*b*).
Key and talk into microphone. Adjust C–2299/VRC VOLUME control as required.	Transmitted signal should be heard on loudspeaker of receiver-transmitter and on handset.	
3 Connect handset to J704 and repeat operations given in step 2 above.	Same as step 2 above	Same as step 2 above.
4 Disconnect CX–4723/VRC from J701 of C–2299/VRC and connect to J702.	None	None.
5 Set RAD TRANS switch to position 2. Use handset to key receiver-transmitter.	Receiver-transmitter should be keyed and rushing noise should be heard.	Higher maintenance level repair required.
6 Disconnect CX–4723/VRC and handset from C–2299/VRC. Make continuity measurements in steps 7 and 8 below.	None	None.
7 Set C–2299/VRC RETRANS switch to OFF. Connect TS–352/U, adjusted to measure RX1, to pins of following receptacles:		Higher maintenance level repair required.
J701 *J702*		
a. K and A	*a.* 150 ohms.	
b. K and A	*b.* 150 ohms.	
c. V and A	*c.* 150 ohms.	
8 Set C–2299/VRC RETRANS switch to ON. Connect TS–352B/U, adjusted to measure RX1, to pins of following receptacles.	TS–352B/U should indicate continuity for each measurement.	Higher maintenance level repair required.
J701 *J702*		
a. K U		
b. U K		
c. T S		
d. S T		
e. S and L		
f. S and L		

3–7. Repair of C–2299/VRC

Repair parts for the C–2299/VRC are listed in appendix C.

a. Replace the front panel knobs as required. Check to see that the nuts holding the knobs and the locknuts holding the cable receptacles are secured tightly.

b. To replace microphone amplifier module A80 (A, fig. 2–6), remove the back cover from the box. Loosen the screws holding the module bracket and carefully remove the module. Check to see that the rubber pad is fastened to the stud under the module. A similar pad should be fastened to the cover. (The pads prevent the module from vibrating during motion of the vehicle.) Carefully position the replacement module pins in line with the receptacle, press the module in place, and tighten the mounting bracket screws.

c. Inspect the parts inside the box for loose parts and damaged wiring; tighten all screws and nuts. Before replacing the back cover, apply a light coating of insulating silicon compound (FSN 6850–880–7616), or equal, to the preformed packing in the back cover. Replace the back cover and tighten the captive screws.

Section III. DEPOT MAINTENANCE

3–8. General

Maintenance of the C–2299/VRC at depot level facilities includes complete repair of the unit and overhaul as required. It also includes checking the performance of the repaired equipment

for conformance with the depot overhaul standards.

3-9. Test Equipment and Test Facilities Required

a. Test Equipment.

(1) Multimeter TS-353B/U.

(2) Power Supply PP-1104/G.

(3) Voltmeter, Electronic ME-30(*)/U. (ME-30(*)/U represents all models of the voltmeter.)

(4) Generator, Signal AN/URM-127.

(5) Spectrum Analyzer TS-723B/U.

(6) Oscilloscope AN/USM-281A.

b. Test Facilities.

(1) Test cable No. 1 (2 each), fabricated in accordance with details in figure 3-5.

(2) Test cable No. 2 (2 each), fabricated in accordance with details in figure 3-5.

(3) Resistor, 150 ohms, 2 watts (3 each).

3-10. Performance Check and Troubleshooting Microphone Amplifier Module A80

Refer to figure 3-4 for schematic diagram of A80 and to figures 3-6 and 3-7 for location of parts. The following procedures are performed on the A80 disconnected from the C-2299/VRC:

a. Test Setup. The following test setup will be used to check the performance of the A80 module (*b* below).

(1) Connect the positive terminal of PP-1104/G to terminal 3 and the negative terminal to terminal 1 (ground) of A80.

(2) Connect a 150-ohm resistor to the output of AN/URM-127. Connect the output of AN/URM-127 and the input of ME-30(*)/U to terminals 2 and 1 of A80.

(3) Connect a 150-ohm resistor to output terminals 4 and 1 of A80. Connect the AN/USM-281A to the TS-723B/U OSCILLOSCOPE terminals.

b. Performance Check. Connect the test equipment to A80 as explained in *a* above.

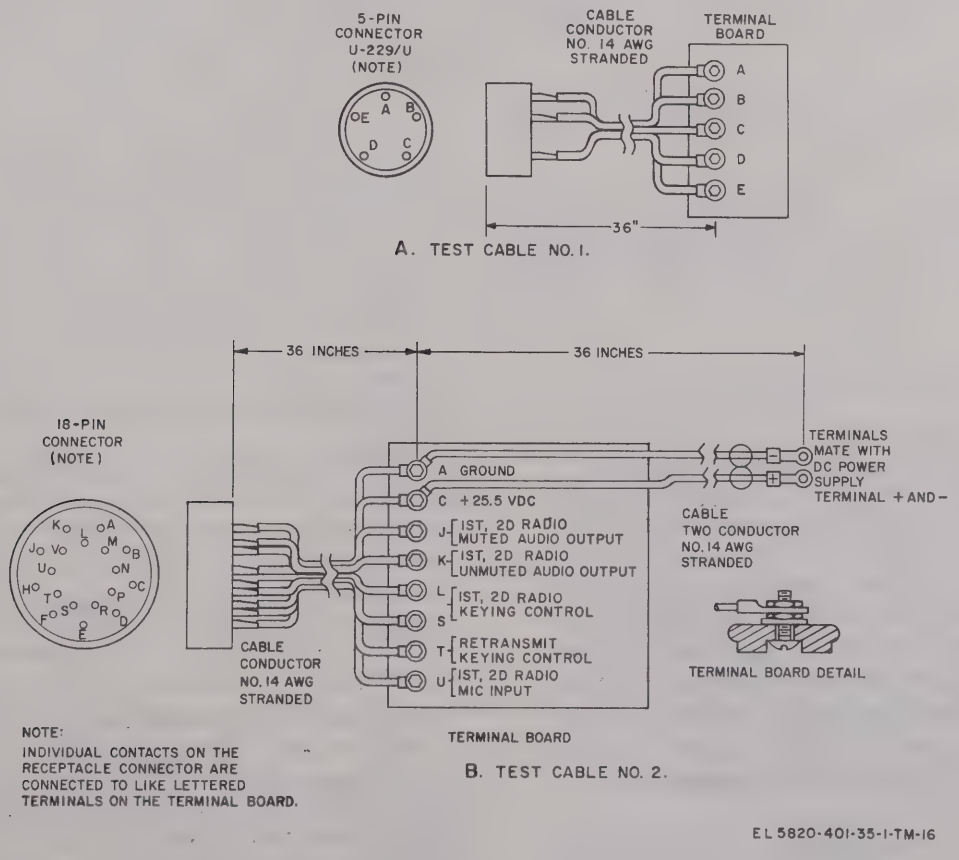
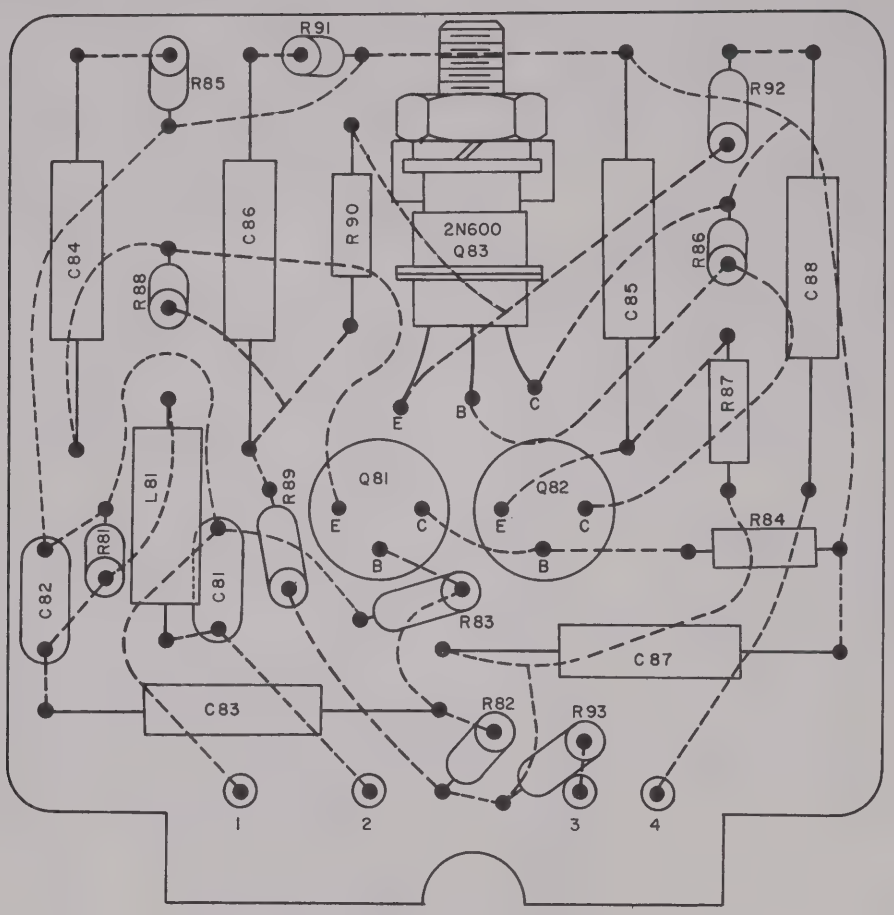


Figure 3-5. Fabrication details for test cables No. 1 and 2.



NOTES:

1. CIRCUIT VIEWED FROM SIDE ON WHICH PARTS ARE MOUNTED.
2. ——PARTS AND PIGTAILS ON FRONT OF BOARD.
3. - - - WIRING ON BACK OF BOARD.
4. PREFACE REFERENCE DESIGNATIONS WITH A80A1.

EL5820-401-35-1-TM-19

Figure 3-6. Microphone amplifier A80, printed circuit board assembly A80A1, parts location; earlier version.

(1) Adjust the output of the PP-1104/G to 22 volts. Adjust the output of the AN/URM-127 to 500 Hz and then 3,000 Hz. Adjust the output of each frequency to 0.007 volt ac as measured on the ME-30(*)/U. At each frequency, observe the output voltage by connecting the TS-723B/U METER terminals across the 150-ohm output load resistor (*a*(3) above), and observe the output distortion by connecting the TS-723B/U AF INPUT terminals across the 150-ohm resistor. Also observe the sine wave indication of the signal on the AN/USM-281A.

(2) Repeat the operations in (1) above, except set the output of the PP-1104/G to 25.5 and 30.0 volts, in turn.

(3) The level of the output signal should be 0.22 volt ac ±2 db and the signal distortion should be no more than 2 percent. The sine wave indication on the oscilloscope should be undistorted.

(4) If the required indications in (3) above are normal, the A80 is acceptable.

c. Trouble Isolation.

(1) Remove the cover from the A80. Figures 3-6 and 3-7 show parts location.

(2) Connect the PP-1104/G, AN/URM-127, ME-30(*)/U, and load resistors as explained in *a* above.

(3) Adjust the output of the AN/URM-127U to 1,000 Hz and the signal level at 0.007 as

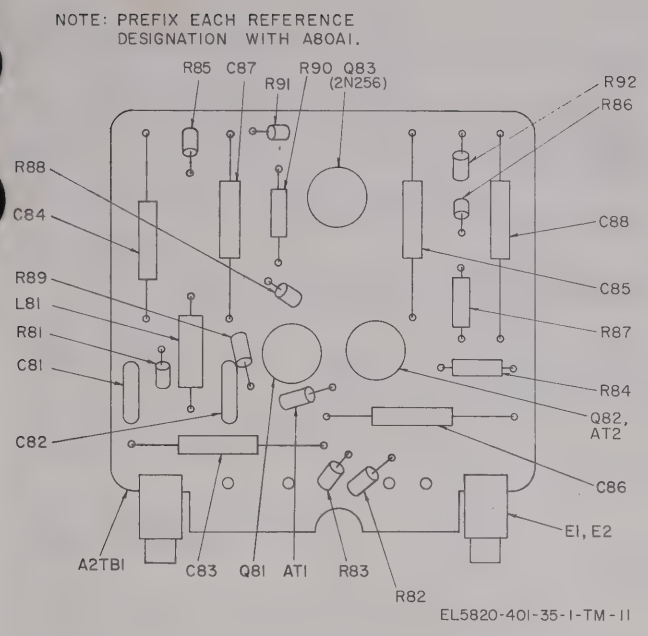


Figure 3–7. Microphone amplifier A80, printed circuit board assembly A80A1, parts location; latest version.

measured on the ME–30(*)/U. Use the ME–30(*)/U to measure the ac signal voltages ((*a*) below). Dc voltage measurements are given in (*b*) below. The voltages given in the charts are typical; wide variations from these values indicate trouble.

(*a*) *Ac signal voltage chart for A80.* The typical ac voltage indications at indicated points of A80 are obtained with test setup given in (2) and (3) above. Use ME–30(*)/U to make the voltage measurements.

Point of measurement	*Ac signal voltage*
Pin 2	0.007
Junction of L81 and C83	0.007
Q81 base	0.007
Q81 emitter	0.006
Q81 collector	0.019
Junction of C84 and R85	0.006
Q82 base	0.019
Q82 emitter	0.007
Q82 collector	2.28
Q83 base	2.28
Q83 emitter	2.26
Q63 collector	0
Junction of R90 and C86	0.82
Junction of C86 and R91	0.08
Junction of R89 and C87	0.001
Junction of R92 and C88	0.23
Pin 4	0.22

(*b*) *Dc voltage chart for A80.* The typical dc voltage indications are indicated points of A80 are obtained with PP–1104/G adjusted to 25.5 volts and connected to pins 3 (+) and 1 (negative ground). Use the TS–352B/U to make the dc voltage measurements.

Point of measurement	*+dc voltage*
Pin 3	25.5
Junction of R93 and R89	24.5
Q83 base	7.4
Q83 emitter	7.7
Q83 collector	0
Q82 base	15.4
Q82 emitter	15.5
Q82 collector	7.4
Q81 base	17.2
Q81 emitter	17.4
A81 collector	15.4

3–11. Troubleshooting and Repair

a. Troubleshooting.

(1) To test the C–2299/VRC before troubleshooting and after repair, use procedures given in paragraph 3–12.

(2) Use TS–352B/U to make continuity and resistance measurements of the C–2299/VRC (figs. 3–2 and 3–3; also steps 7 and 8, para 3–6*c*).

b. Repair. Repair parts for the C–2299/VRC and parts location illustrations are provided in appendix C. Replacement of microphone amplifier module A80 and other parts are explained in paragraph 3–7.

3–12. Depot Overhaul Standards—Performance Tests

Tests on repaired equipment are designed to measure the performance capability of the equipment. Equipment that is returned to stock should meet the standards given in the tests.

NOTE

The depot overhaul standards (*c* below) should not be used to test the performance of *new* equipment; that is, equipment that has not been repaired or rebuilt. Such equipment should be tested for conformance with the electrical and operational tests cited in MIL–C–55126-(EL) under which the equipment was manufactured including any waivers and/or changes to the specification which were imposed upon or granted to the particular manufacturer of the equipment. For such information, address correspondence to Commander, US Army Electronics Command, ATTN: AMSEL–BE–EC, Fort Monmouth, N.J. 07703.

a. Applicable References.

(1) *Repair standards.* Applicable procedures of the depots performing the test and general standards for repaired electronic equipment given in TB SIG 355–1, TB SIG 355–2, and TB SIG 355–3 form a part of the requirement for testing the C–2299/VRC.

(2) *Modification work orders.* Perform all modification work orders (MWO's) applicable to the C–2299/VRC before making the tests of the C–2299/VRC. DA Pam 310–7 lists all current MWO's.

b. Test Equipment and Materials Required. The required items are listed in paragraph 3–9.

c. Depot Overhaul Standards.

(1) *Test setup* (fig. 3–8).

(*a*) Connect test cables No. 1 and 2 to C–2299/VRC as shown in figure 3–8.

(*b*) Connect a 150-ohm resistor to terminals U and A of each test cable No. 2.

(*c*) Turn off the PP–1104/G and connect its output to terminals C (+) and A (negative, ground) of test cable No. 2 (fig. 3–5) connected to J701.

(*d*) Connect a 150-ohm resistor to the output of AN/URM–127 and use ME–30(*)/U connected across the resistor to measure the output signal level of each test frequency.

(*e*) Proceed to tests ((2) below).

(2) *Audio amplifier performance tests.* Set up the equipment as explained in (1) above.

(*a*) Turn on and adjust the output of the PP–1104/G to 22 volts.

(*b*) Connect the AN/URM–127 ((1)(*d*) above) to terminals D and A of test cable No. 1 connected to J703.

(*c*) Adjust the output of AN/URM–127 for 500 Hz at 0.007 volt.

(*d*) Measure A80 output across 150-ohm resistor connected to J701 as follows:

1. Connect TS–723B/U METER terminals across the resistor. The signal voltage should be 0.22 volt ±2 db.

2. Connect TS–723B/U AF INPUT terminals across the resistor. The signal distortion should be less than 2 percent.

(*e*) Change AN/URM–127 output frequency to 3,000 Hz at 0.007 volt and repeat measurement in (*d*) above.

(*f*) Change AN/URM–127 output frequency to 1,000 Hz at 0.007 volt and repeat measurements in (*d*) above.

(*g*) Adjust the output voltage of PP–1104/G to 30.0 volts and repeat measurements in (*d*) above.

(*h*) Adjust output voltage of PP–1104/G to 25.5 volts and repeat measurements in (*d*) above.

(*i*) Change connection of AN/URM–127 to terminals D and A of J704. Repeat voltage measurement in (*d*)*1* above.

(*j*) Remove connection of TS–723B/U from J701 and connect to 150-ohm resistor con-

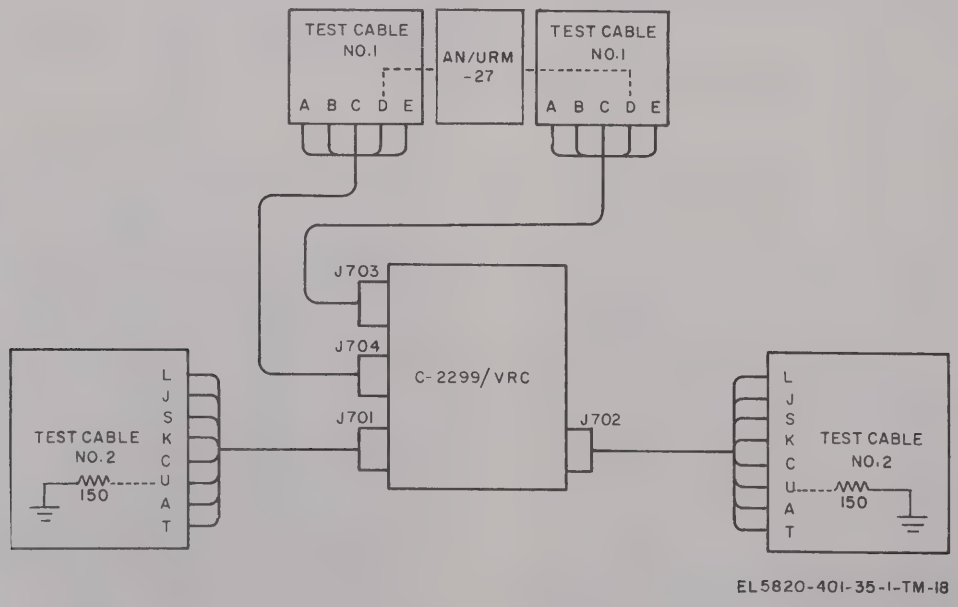


Figure 3–8. Connection of tests cables No. 1 and 2 to C–2299/VRC.

nected to U and A of J702. Set C–2299/VRC RAD TRANS switch to position 2. Repeat voltage measurement in (*d*)*1* above.

(*k*) Turn off PP–1104/G and remove connections of PP–1104/G, resistors, and test equipment from the test cables.

(*l*) Make continuity measurements in (3) and (4) below.

(3) *Continuity tests.* Use the TS–352B/U, adjusted to measure resistance (RX1), to make following circuit continuity measurements. Leave test cables connected to C–2299/VRC (fig. 3–8). Continuity (0 ohm) should be obtained for each terminal-to-terminal measurement, except when 150 ohms is indicated. When no switch/position is given, switches may be set in any position. Before proceeding, set C–2299/VRC VOLUME control fully counterclockwise.

Switch/position	Receptacles/terminals			
	J701	J702	J703	J704
			B and E	
			B	B
			B	E
				B and E
RAD TRANS: 1	L		C	
	L			C
	J		B	
	J			B
RAD TRANS: 2		L	C	
		L		C
		J	B	
		J		B
RETRANS: OFF	L and S			
		L and S		
		K and V		
	K and A (150 ohms)			
		K and A (150 ohms)		
RETRANS: ON	S	T		
	T	S		
	K	U		
	U	K		

(4) *VOLUME control tests.*

(*a*) Connect the TS–352B/U between terminals E of J703 and J of J701.

(*b*) Adjust the TS–723B/U for on-scale ohms indications while rotating the VOLUME control from counterclockwise to clockwise positions.

(*c*) The TS–352B/U should indicate no erratic movement during rotation of the control and should register between 0 and 100,000 ohms (±10 percent).

APPENDIX A

REFERENCES

DA Pam 310–4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
DA Pam 310–7	U. S. Army Equipment Index of Modification Work Orders.
SB 11–131	Vehicular Radio Sets and Authorized Installations.
TB SIG 355–1	Depot Inspection Standard for Repaired Signal Equipment.
TB SIG 355–2	Depot Inspection Standard for Refinishing Repaired Signal Equipment.
TB SIG 355–3	Depot Inspection Standard for Moisture and Fungus Resistant Treatment.
TM 11–5820–401–12	Operator and Organizational Maintenance Manual Including Repair Parts and Special Tools Lists for Radio Sets AN/VRC–12, AN/VRC–43, AN/VRC–44, AN/VRC–45, AN/VRC–46, AN/VRC–47, AN/VRC–48, AN/VRC–49, AN/VRC–54, and AN/VRC–55; Mounting MT–1029 and MT–1898/VRC; Antenna AT–912/VRC; Control, Frequency Selector, and Control, Radio Set C–2299/VRC.
TM 11–5965–260–15P	Operator's, Organizational, Field and Depot Maintenance Repair Parts and Special Tool Lists: Headset, Electrical H–140A/U.
TM 11–5965–280–15	Operator, Organizational, DS, GS, and Depot Maintenance Manual, Including Repair Parts and Special Tools List: Handset H–189/GR.
TM 11–5985–262–15	Operator, Organizational, DS, GS, and Depot Maintenance Manual Including Repair Parts and Special Tool Lists: Antenna AS–1729/VRC.
TM 11–6130–246–12	Operator and Organizational Maintenance Manual: Power Supply PP–1104C/G (with Instructions for Use as a Battery Charger).
TM 11–6625–366–15	Organizational, DS, GS, and Depot Maintenance Manual: Multimeter TS–352B/U.
TM 11–6625–446–15	Operator, Organizational, Field and Depot Maintenance Manual: Wattmeter AN/URM–120.
TM 38–750	The Army Maintenance Management System (TAMMS).

APPENDIX B

DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST FOR CONTROL, FREQUENCY SELECTOR C–2742/VRC

Section I. INTRODUCTION

B–1. General

This appendix lists repair parts required for the performance of maintenance for Control, Frequency Selector C–2742/VRC. This appendix is divided into the following sections:

a. Repair Parts, Section II. A list of repair parts authorized for the performance of maintenance at direct support, general support, and depot level.

b. Index—Federal Stock Number Cross-Reference to Figure and Item Number or Reference Designation, Section III. A list of Federal Stock Numbers (FSN's) in ascending numerical sequence followed by a list of reference numbers in ascending alphanumerical sequence, cross-referenced to figure number and reference designation.

c. Special Tools, Test, and Support Equipment. Not applicable.

B–2. Explanation of Columns

The following provides an explanation of the columns of the repair parts list (sec. II).

a. Source, Maintenance, and Recoverability (SMR) Codes, Column 1.

(1) *Source code.* This indicates the selection status and source for the listed item. Source codes used are—

Code	*Explanation*
P	Repair parts which are stocked in or supplied form the GSA/DSA, or Army supply system and authorized for use at indicated maintenance categories.
P2	Repair parts which are procured and stocked for insurance purposes because the combat or military essentiality of the end item dictates that a minimum quantity be available in the supply system.
P9	Assigned to items which are NSA design controlled: unique repair parts, special tools, test, measuring and diagnostic equipment, which are stocked and supplied by the Army COMSEC logistic system, and which are not subject to the provisions of AR 380–41.
P10	Assigned to items which are NSA design controlled: special tools, test, measuring and diagnostic equipment for COMSEC support, which are accountable under the provisions of AR 380–41, and which are stocked and supplied by the Army COMSEC logistic system.
M	Repair parts which are not procured or stocked, but are to be manufactured at indicated maintenance levels.
A	Assemblies which are not procured or stocked as such, but are made up of two or more units. Such component units carry individual stock numbers and descriptions, are procured and stocked separately and can be assembled to form the required assembly at indicated maintenance categories.
X	Parts and assemblies which are not procured or stocked and the mortality of which normally is below that of the applicable end item or component. The failure of such part or assembly should result in retirement of the end item from the supply system.
X1	Repair parts which are not procured or stocked. The requirement for such items will be filled by use of the next higher assembly or component.

Code	*Explanation*
X2	Repair parts which are not stocked. The indicated maintenance category requiring such repair parts will attempt to obtain same through cannibalization. Where such repair parts are not obtainable through cannibalization, requirements will be requisitioned, with accompanying justification, through normal supply channels.
G	Major assemblies that are procured with PEMA funds for initial issue only as exchange assemblies at DSU and GSU level. These assemblies will not be stocked above DS and GS level or returned to depot supply level.

(2) *Maintenance code.* This code indicates the lowest category of maintenance authorized to install the listed item. The maintenance level codes are—

Code	*Explanation*
O	Organizational maintenance
F	Direct support maintenance
H	General support maintenance
D	Depot maintenance

(3) *Recoverability code.* This code indicates whether unserviceable items should be returned for recovery or salvage. Items not coded are expendable. Recoverability codes are—

Code	*Explanation*
R	Repair parts and assemblies that are economically repairable at DSU and GSU activities and are normally furnished by supply on an exchange basis.
S	Repair parts and assemblies which are economically repairable at DSU and GSU activities and which normally are furnished by supply on an exchange basis. When items are determined by a GSU to be uneconomically repairable, they will be evacuated to a depot for evaluation and analysis before final disposition.
T	High-dollar value recoverable repair parts which are subject to special handling and are issued on an exchange basis. Such repair parts normally are repaired or overhauled at depot maintenance activities.
U	Repair parts specifically selected for salvage by reclamation units because of precious metal content, critical materials, or high-dollar value reusable casings or castings.

b. Federal Stock Number (FSN), Column 2. This column indicates the Federal stock number of the item and will be used for requisitioning purposes.

c. Description, Column 3. This column indicates the Federal item name and any additional description of the item required. A part number or other reference number is followed by the applicable five-digit Federal supply code for the manufacturer in parentheses. Repair parts quantities included in the kits, sets, and assemblies are shown in front of the repair part item.

d. Unit of Measure, Column 4. A two-character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowances are based; e.g., ft, ea, pr, etc.

e. Quantity Incorporated in Unit, Column 5. This column indicates the quantity of the item used.

f. 30-Day DS/GS Maintenance Allowances, Columns 6 and 7. Allowances in GS column are for GS maintenance only. Subsequent appearances of the same item will have the letters "REF" in the applicable allowance columns. Items authorized for use as required but not for initial stockage are identified with an asterisk in the allowance column.

g. One-Year Allowance per 100 Equipments/ Contingency Planning Purposes, Column 8. This column indicates opposite the first appearance of each item the total quantity required for distribution and contingency planning purposes. Items authorized for use as required but not for initial stockage are identified with an asterisk in the allowance column.

h. Depot Maintenance Allowance for 100 Equipments, Column 9. This column indicates opposite the first appearance of each item, the total quantity authorized for depot maintenance of 100 equipments. Subsequent appearances of the same item will have the letters "REF" in the allowance column. Items authorized for use as required but not for initial stockage are identified with an asterisk in the allowance column.

i. Illustrations, Column 10. This column is divided as follows:

(1) *Figure number, column 10a.* Indicates the figure number in which the item is shown.

(2) *Item number or reference designation, column 10b.* Indicates the reference designation used to identify the item in the illustration.

SECTION II REPAIR PARTS FOR DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE (C-2742/VRC)

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REFERENCE NUMBER & MFR. CODE USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30-DAY DS MAINT ALLOWANCE (a) 1-20	(b) 21-50	(c) 51-100	(7) 30-DAY GS MAINT ALLOWANCE (a) 1-20	(b) 21-50	(c) 51-100	(8) 1 YR ALW PER EQUIP CNTGCY	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATIONS (a) FIG NO.	(b) ITEM NO. OR REFERENCE DESIGNATION
P -S-O	5820-892-3343	CONTROL, FREQUENCY SELECTOR: C-2742/VRC SM-D-415151 (80063)	EA	1	*	*	*	*	*	*	*	*	1-1	
M -D		COVER ASSEMBLY: SM-D-415173 (80063)	EA	1									B-1	
M -D		COVER: SM-D-415175 (80063)	EA	1									"	MP2
P -F	5330-892-4111	PACKING, PREFORMED: SM-C-414114-10 (80063)	EA	1				*	*	*	*	*	"	01
P -F	5305-823-5837	SCREW, EXTERNALLY RELIEVED BODY: SM-C-413884-7 (80063)	EA	4				*	*	*	*	*	"	H1
P -F	5310-820-5827	WASHER, SPLIT: MS35338-5 (96906)	EA	4				*	*	*	*	*	"	H2
P -F	5945-823-2668	RELAY, ARMATURE: SM-D-415157 (80063)	EA	1				*	*	*	*	*	"	K71
P -D	5935-886-9597	SOCKET, RELAY: SM-D-415156 (80063)	EA	1							*	*	"	XK71
P -D	5310-019-1716	NUT, PLAIN, HEXAGON: MS35649-21 (96906)	EA	2							*	*	"	H3
P -D	5310-543-5060	WASHER, SPLIT: MS35338-39 (96906)	EA	2							*	*	"	H4
M -D		WIRING, HARNESS: SM-D-415182 (80063)	EA	1									"	W1
P -D	5940-050-2308	TERMINAL, LUG: MS35431-3 (96906)	EA	2							*	*	"	E75
P -D	5940-050-2308	TERMINAL, LUG: MS35431-3 (96906)	EA	REF							*	*		
P -D	5305-638-3435	SCREW, MACHINE: MS35223-25 (96906)	EA	2							*	*	"	H5
P -D	5310-209-0788	WASHER, LOCK: MS35335-30 (96906)	EA	2							*	*	"	H6
P -D	5961-985-4900	SEMICONDUCTOR DEVICE, DIODE: IN647 (81349)	EA	2							*	*	"	CR71
P -D	5961-985-4900	SEMICONDUCTOR DEVICE, DIODE: IN647 (81349)	EA	REF							*	*	"	CR72
M -D	5940-999-5279	BRACKET ASSEMBLY: SM-B-415176 (80063)	EA	1							*	*	"	MP4
P -D	5305-823-5837	SCREW, MACHINE: SM-C-413884-11 (80063)	EA	2							*	*	"	H7
P -O	5355-667-5889	KNOB: SM-D-415160 (80063)	EA	1	*	*	*	*	*	*	*	*	"	MP5
P -O	5305-893-8484	SCREW, MACHINE: SM-B-283611-1 (80063)	EA	2	*	*	*	*	*	*	*	*	"	H8
P -O	5355-163-1617	KNOB: SM-D-415161 (80063)	EA	1	*	*	*	*	*	*	*	*	"	MP6
P -O	5305-893-8484	SCREW, MACHINE: SM-B-283611-1 (80063)	EA	REF	*	*	*	*	*	*	*	*	"	H9
P -O	5310-823-8791	NUT, PLAIN, HEXAGON: SM-C-415158 (80063)	EA	1	*	*	*	*	*	*	*	*	"	H10
P -D	5355-856-4523	KNOB, STOP: SM-B-415169 (80063)	EA	1							*	*	"	MP7
P -D	5355-856-4522	LOCK, STOP: SM-C-415159 (80063)	EA	1							*	*	"	MP8
P -D	6210-883-5603	LIGHT, INDICATOR: SM-C-415155 (80063)	EA	1							*	*	"	MP9
P -O	6210-886-5950	LENS: 174113 (72619)	EA	1	*	*	*	*	*	*	*	*	"	MP10

SECTION II REPAIR PARTS FOR DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE (CONTINUED)

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REFERENCE NUMBER & MFR. CODE / USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30-DAY DS MAINT ALLOWANCE (a) 1-20	(b) 21-50	(c) 51-100	(7) 30-DAY GS MAINT ALLOWANCE (a) 1-20	(b) 21-50	(c) 51-100	(8) 1 YR ALW PER EQUIP CNTGCY	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATIONS (a) FIG NO.	(b) ITEM NO. OR REFERENCE DESIGNATION
P -O	6240-155-7836	LAMP, INCANDESCENT: MS25237-327 (96906)	EA	1	*	*	*	*	*	*	*	*	B-1	DS71
P -D	5930-655-1517	SWITCH, TOGGLE: SM-D-415153 (80063)	EA	1							*	*	"	S73
P -D	5930-889-5921	SWITCH, ROTARY: SM-D-415162 (80063)	EA	1							*	*	"	S71
P -D	5930-889-5920	SWITCH, ROTARY: SM-D-415163 (80063)	EA	1							*	*	"	S72
P -O	5935-958-4869	CAP, DUST: SM-B-104328 (80063)	EA	2	*	*	*	*	*	*	*	*	"	MP11
P -D	5935-853-6676	CONNECTOR, RECEPTACLE, ELECTRICAL: SM-D-414991 (80063)	EA	2							*	*	"	J71
P -D	5935-853-6676	CONNECTOR, RECEPTACLE, ELECTRICAL: SM-D-414991 (80063)	EA	REF							*	*	"	J72
M -D		PLATE, IDENTIFICATION: SM-C-415164 (80063)	EA	1									"	MP12
P -D	5305-625-5747	SCREW, MACHINE: MS35223-1 (96906)	EA	2							*	*	"	H11
M -D		PLATE, MARKING: SM-B-415154 (80063)	EA	1							*	*	"	MP13
XI		HOUSING ASSEMBLY: SM-D-415166 (80063)	EA	1									"	MP14
M -D		MOUNTING,HARDWARE,KIT: SM-B-415179 (80063)	EA	1									B-2	
M -D		BAG, COTTON, DUCK: SM-B-415047 (80063)	EA	2									"	CW1
P -D	5310-582-5615	NUT, PLAIN, HEXAGON: MS35690-522 (96906)	EA	2							*	*	"	H12
P -D	5306-559-0473	SCREW, CAP, HEXAGON: MS35292-34 (96906)	EA	2							*	*	"	H13
P -D	5305-068-0506	SCREW, CAP, HEXAGON: MS90726-6 (96906)	EA	2							*	*	"	H14
P -D	5310-889-2528	WASHER, SPLIT: MS45904-68 (96906)	EA	2							*	*	"	H15
P -D	5310-889-2527	WASHER, SPLIT: MS45904-72 (96906)	EA	2							*	*	"	H16

SECTION III INDEX-FEDERAL STOCK NUMBER AND REFERENCE NUMBER CROSS REFERENCE TO FIGURE AND ITEM NUMBER OR REFERENCE DESIGNATION (C-2742/VRC)

FEDERAL STOCK NUMBER	FIGURE NUMBER	ITEM NUMBER OR REF. DESIGNATION
5305-068-0506	B-2	H14
5305-625-5747	B-1	H11
5305-638-3435	"	H5
5305-823-5837	"	H1
5305-823-5837	"	H7
5305-893-8484	"	H8
5305-893-8484	"	H9
5306-559-0473	B-2	H13
5310-919-1716	B-1	H3
5310-209-0788	"	H6
5310-543-5060	"	H4
5310-582-5615	B-2	H12
5310-820-5827	B-1	H2
5310-823-8791	"	H10
5310-889-2527	B-2	H16
5310-889-2528	"	H15
5330-892-4111	B-1	MP2
5355-163-1617	"	MP6
5355-667-5889	"	MP5
5355-856-4522	"	MP8
5355-856-4523	"	MP7
5820-892-3343	"	
5930-655-1517	"	S73
5930-889-5920	"	S72
5930-889-5921	"	S71
5935-853-6676	"	J71
5935-853-6676	"	J72
5935-886-9597	"	XK71
5935-958-4869	"	MP11
5940-050-2308	"	E75
5940-999-5279	"	MP4
5945-823-2668	"	K71
5961-985-4900	"	CR1
5961-985-4900	"	CR2
6210-883-5603	"	MP9
6210-886-5950	B-1	MP10
6240-155-7836	"	DS71
MS25237-327	"	DS71
MS35223-1	"	H11
MS35223-25	"	H5
MS35292-34	B-2	H13
MS35335-30	B-1	H6
MS35338-5	"	H2
MS35338-39	"	H4
MS35431-3	"	E75
MS35649-21	"	H3
MS35690-22	B-2	H12
MS45904-68	"	H15
MS45904-72	"	H16
MS90726-6	"	H14
SM-B-104328	B-1	MP11
SM-B-283611-1	"	H8
SM-B-283611-1	"	H9
SM-B-415047	B-2	CW1
SM-B-415154	B-1	MP13
SM-B-415169	"	MP7
SM-B-415176	"	MP4
SM-C-413884-7	"	H1
SM-C-413884-11	"	H7
SM-C-414114-10	"	MP2
SM-C-415155	"	MP9
SM-C-415158	"	H10
SM-C-415159	"	MP8
SM-C-415164	"	MP12
SM-D-414991	"	J71
SM-D-414991	"	J72
SM-D-415153	"	S73
SM-D-415156	"	XK71
SM-D-415157	"	K71
SM-D-415160	"	MP5

SECTION III INDEX-FEDERAL STOCK NUMBER AND REFERENCE NUMBER CROSS REFERENCE TO FIGURE AND ITEM NUMBER OR REFERENCE DESIGNATION (CONTINUED)

FEDERAL STOCK NUMBER	FIGURE NUMBER	ITEM NUMBER OR REF. DESIGNATION
SM-D-415161	B-1	MP6
SM-D-415162	"	S71
SM-D-415163	"	S72
SM-D-415166	"	MP14
SM-D-415175	"	MP2
SM-D-415182	"	W1
1N647	"	CR1
1N647	"	CR2
174113	"	MP10

FEDERAL STOCK NUMBER	FIGURE NUMBER	ITEM NUMBER OR REF. DESIGNATION

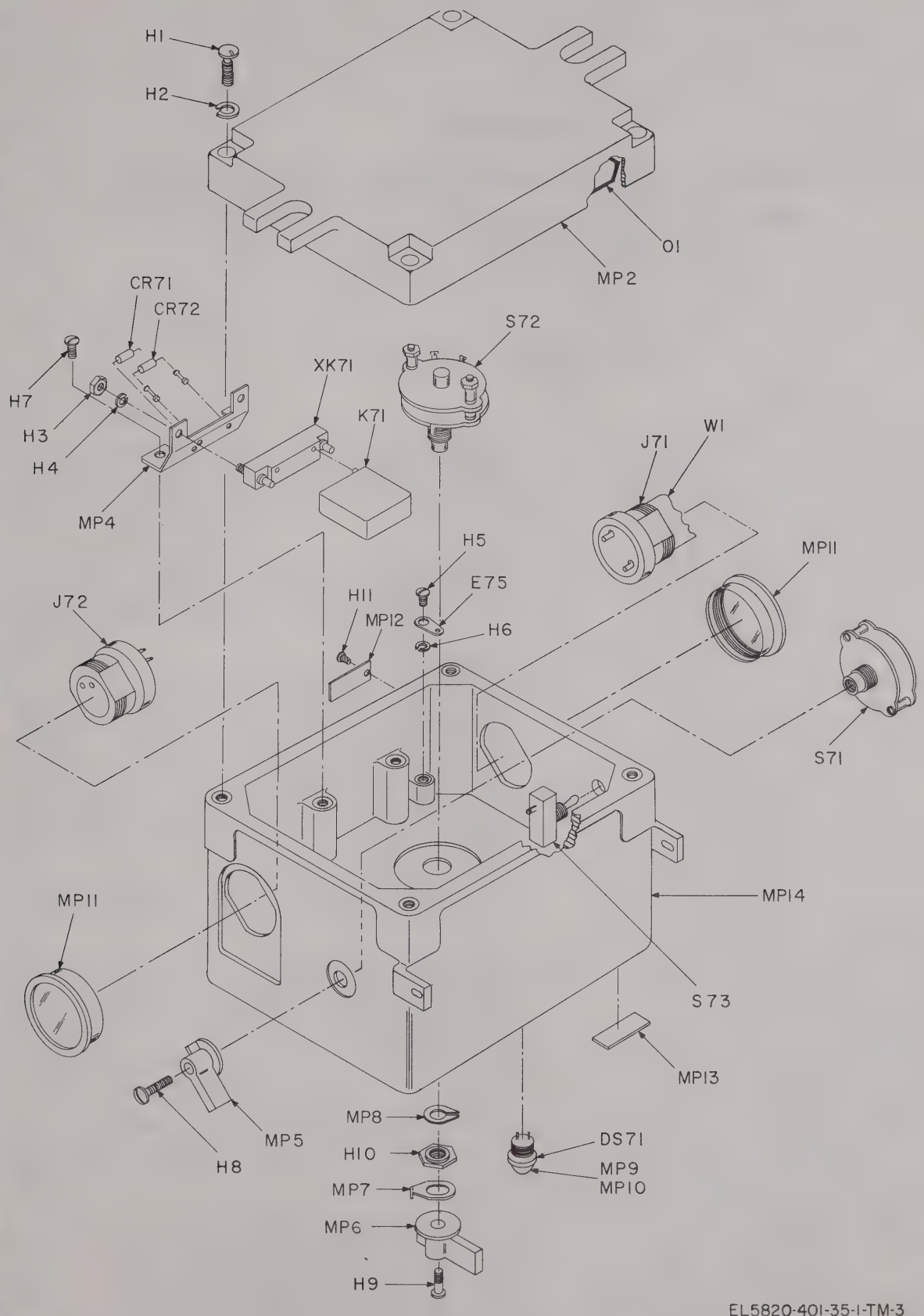


Figure B-1. Control, Frequency Selector C-2742/VRC, exploded view, parts location.

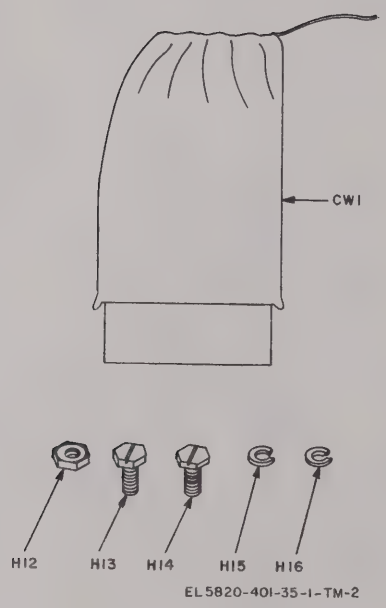


Figure B–2. Hardware mounting kit for C–2742/VRC, parts.

APPENDIX C

DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST FOR CONTROL, RADIO SET C–2299/VRC

Section I. INTRODUCTION

C–1. General

This appendix lists repair parts required for the performance of maintenance for Control, Radio Set C–2299/VRC. This appendix is divided into the following sections:

a. Repair Parts, Section II. A list of repair parts authorized for the performance of maintenance at direct support, general support, and depot level.

b. Index—Federal Stock Number Cross-Reference to Figure and Item Number or Reference Designation, Section III. A list of Federal stock numbers (FSN's) in ascending numerical sequence followed by a list of reference numbers in ascending alphanumerical sequence, cross-referenced to figure number and reference designation.

c. Special Tools, Test, and Support Equipment. Not applicable.

C–2. Explanation of Columns

The following provides an explanation of the columns of the repair parts list (sec. II).

a. Source, Maintenance, and Recoverability (SMR) Codes, Column 1.

(1) *Source code.* This indicates the selection status and source for the listed item. Source codes used are—

Code — *Explanation*

P—Repair parts which are stocked in or supplied form the GSA/DSA, or Army supply system and authorized for use at indicated maintenance categories.

P2—Repair parts which are procured and stocked for insurance purposes because the combat or military essentiality of the end item dictates that a minimum quantity be available in the supply system.

P9—Assigned to items which are NSA design controlled: unique repair parts, special tools, test, measuring and diagnostic equipment, which are stocked and supplied by the Army COMSEC logistic system, and which are not subject to the provisions of AR 380–41.

P10—Assigned to items which are NSA design controlled: special tools, test, measuring and diagnostic equipment for COMSEC support, which are accountable under the provisions of AR 380–41, and which are stocked and supplied by the Army COMSEC logistic system.

M—Repair parts which are not procured or stocked, but are to be manufactured at indicated maintenance levels.

A—Assemblies which are not procured or stocked as such, but are made up of two or more units. Such component units carry individual stock numbers and descriptions, are procured and stocked separately and can be assembled to form the required assembly at indicated maintenance categories.

X—Parts and assemblies which are not procured or stocked and the mortality of which normally is below that of the applicable end item or component. The failure of such part or assembly should result in retirement of the end item from the supply system.

X1—Repair parts which are not procured or stocked. The requirement for such items will be filled by use of the next higher assembly or component.

Code	*Explanation*
X2	Repair parts which are not stocked. The indicated maintenance category requiring such repair parts will attempt to obtain same through cannibalization. Where such repair parts are not obtainable through cannibalization, requirements will be requisitioned, with accompanying justification, through normal supply channels.
G	Major assemblies that are procured with PEMA funds for initial issue only as exchange assemblies at DSU and GSU level. These assemblies will not be stocked above DS and GS level or returned to depot supply level.

(2) *Maintenance code.* This code indicates the lowest category of maintenance authorized to install the listed item. The maintenance level codes are—

Code	*Explanation*
O	Organizational maintenance
F	Direct support maintenance
H	General support maintenance
D	Depot maintenance

(3) *Recoverability code.* This code indicates whether unserviceable items should be returned for recovery or salvage. Items not coded are expendable. Recoverability codes are—

Code	*Explanation*
R	Repair parts and assemblies that are economically repairable at DSU and GSU activities and are normally furnished by supply on an exchange basis.
S	Repair parts and assemblies which are economically repairable at DSU and GSU activities and which normally are furnished by supply on an exchange basis. When items are determined by a GSU to be uneconomically repairable, they will be evacuated to a depot for evaluation and analysis before final disposition.
T	High-dollar value recoverable repair parts which are subject to special handling and are issued on an exchange basis. Such repair parts normally are repaired or overhauled at depot maintenance activities.
U	Repair parts specifically selected for salvage by reclamation units because of precious metal content, critical materials, or high-dollar value reusable casings or castings.

b. Federal Stock Number (FSN), Column 2. This column indicates the Federal stock number of the item and will be used for requisitioning purposes.

c. Description, Column 3. This column indicates the Federal item name and any additional description of the item required. A part number or other reference number is followed by the applicable five-digit Federal supply code for the manufacturer in parentheses. Repair parts quantities included in the kits, sets, and assemblies are shown in front of the repair part item.

d. Unit of Measure, Column 4. A two-character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowances are based; e.g. ft, ea, pr, etc.

e. Quantity Incorporated in Unit, Column 5. This column indicates the quantity of the item used.

f. 30-Day DS/GS Maintenance Allowances, Columns 6 and 7. Allowances in GS column are for GS maintenance only. Subsequent appearances of the same item will have the letters "REF" in the applicable allowance columns. Items authorized for use as required but not for initial stockage are identified with an asterisk in the allowance column.

g. One-Year Allowance per 100 Equipments/ Contingency Planning Purposes, Column 8. This column indicates opposite the first appearance of each item the total quantity required for distribution and contingency planning purposes. Items authorized for use as required but not for initial stockage are identified with an asterisk in the allowance column.

h. Depot Maintenance Allowance for 100 Equipments, Column 9. This column indicates opposite the first appearance of each item, the total quantity authorized for depot maintenance of 100 equipments. Subsequent appearances of the same item will have the letters "REF" in the allowance column. Items authorized for use as required but not for initial stockage are identified with an asterisk in the allowance column.

i. Illustrations, Column 10. This column is divided as follows:

(1) *Figure number, column 10a.* Indicates the figure number in which the item is shown.

(2) *Item number or reference designation, column 10b.* Indicates the reference designation used to identify the item in the illustration.

SECTION II REPAIR PARTS FOR DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE (C-2299/VRC)

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REFERENCE NUMBER & MFR. CODE / USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30-DAY DS MAINT ALLOWANCE (a) 1-20	(b) 21-50	(c) 51-100	(7) 30-DAY GS MAINT ALLOWANCE (a) 1-20	(b) 21-50	(c) 51-100	(8) 1 YR ALW PER EQUIP CNTGCY	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATIONS (a) FIG NO.	(b) ITEM NO. OR REFERENCE DESIGNATION
P -S-O		CONTROL, RADIO SET C-2299/VRC; SM-D-415186 (80063)	EA	1	*	*	*	*	*	*	*	*	1-2	
P -D	5305-903-0339	SCREW,MACHINE: SM-C-414131-2 (80063)	EA	1							*	*	C-1	H701
P -O	5355-853-6384	KNOB: SM-C-414399 (80063)	EA	1	*	*	*	*	*	*	*	*	C-1	MP703
P -D	5940-926-9736	TERMINAL STUD: 4870-1-0516 (71279)	EA	2							*	*	C-1	E704
P -D	5940-926-9736	TERMINAL STUD: 4870-1-0516 (71279)	EA	REF							*	*	C-1	E705
P -D	5905-865-6301	RESISTOR,VARIABLE: SM-D-415189 (80063)	EA	1							*	*	C-1	R701
P -D	5310-853-9676	NUT,SLEEVE: S7892 (02615)	EA	1							*	*	C-1	H702
M -D		PLATE,IDENTIFICATION: SM-C-415190 (80063)	EA	1									C-1	MP702
P -D	5305-625-5747	SCREW,MACHINE: MS535223-1 (96906)	EA	2							*	*	C-1	MP702H2
M -D		PAD: SM-C-415192-1 (80063)	EA	1									C-1	AT701
P -D	5940-082-4622	TERMINAL,STRIP: SM-C-415193 (80063)	EA	1							*	*	C-1	A701
P -D	5305-451-6179	SCREW,EXTERNALLY RECEIVED,BODY: SM-C-413884-11	EA	2							*	*	C-1	A701H2
XI-		BRACKET: SM-C-415195 (80063)	EA	1									C-1	A701MP1
P -D		SCREW,MACHINE: SM-C-413531-14 (80063)	EA	2							*	*	C-1	A701MP1H2
P -D	5310-543-2410	WASHER,LOCK: MS35338-40 (96906)	EA	2							*	*	C-1	A701MP1H3
P -D	5310-167-0815	WASHER,FLAT: AN960-4 (88044)	EA	2							*	*	C-1	A701MP1H4
XI-		TERMINAL,STRIP: SM-C-415196 (80063)	EA	1									C-1	A701MP2
XI-	5940-673-1024	TERMINAL,FEEDTHRU,INSULATED: X2081B (71279)	EA	4									C-1	A701E1
P -F-T	5820-886-3152	AMPLIFIER,AUDIO FREQUENCY: SM-C-415198 (80063)	EA	1				*	*	*	*	*	C-1, C-2	A80
XI-		BASE: SM-D-415200 (80063)	EA	1									C-2	MP1
XI-		COVER: SM-Cp415201 (80063)	EA	1									C-2	MP2
XI-		SCREW,MACHINE: SM-B-413837 (80063)	EA	1									C-2	H1
P -D	5820-949-9907	AMPLIFIER,ASSEMBLY: SM-D-415203 (80063)	EA	1							*	*	C-2, 3-7	A80A1
XI-	5820-999-7300	TERMINAL: SM-B-413841-1 (80063)	EA	2									3-7	E1
XI-	5820-999-7300	TERMINAL: SM-B-413841-1 (80063)	EA	REF									3-7	E2

SECTION II REPAIR PARTS FOR DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE (CONTINUED)

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REFERENCE NUMBER & MFR. CODE USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30-DAY DS MAINT ALLOWANCE (a) 1-20	(b) 21-50	(c) 51-100	(7) 30-DAY GS MAINT ALLOWANCE (a) 1-20	(b) 21-50	(c) 51-100	(8) 1 YR ALW PER EQUIP CNTGCY	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATIONS (a) FIG NO.	(b) ITEM NO. OR REFERENCE DESIGNATION
XI-		PRINTED CIRCUIT BOARD ASSEMBLY: SM-C-415205 (80063)	EA	1									3-6, 3-7	A2TB1
XI-	5325-885-7725	EYELET,METALLIC: S5867 (07707)	EA	4									C-2	A2H4
XI-		PRINTED CIRCUIT BOARD: SM-D-415207 (80063)	EA	1									3-6, 3-7	A2TB1
XI-	5961-892-3473	TRANSISTOR: JAN2N526 (81349)	EA	.3									"	Q81
XI-	5961-892-3473	TRANSISTOR: JAN2N526 (81349)	EA	REF									"	Q82
XI-	5961-892-3473	TRANSISTOR: JAN2N526 (81349)	EA	REF									"	Q83
XI-	5970-752-5321	PAD,TRANSISTOR: A10012 (07047)	EA	2									"	AT1
XI-	5970-752-5321	PAD,TRANSISTOR: A10012 (07047)	EA	REF									"	AT2
XI-	5950-802-1805	CHOKE,RADIO: MS75008-8 (96906)	EA	1									"	L81
XI-	5910-838-9421	CAPACITOR,FIXED,CERAMIC,DIELECTRIC: CK06AW102M (81349)	EA	2									"	C81
XI-	5910-838-9421	CAPACITOR,FIXED,CERAMIC,DIELECTRIC: CK06AW102M (81349)	EA	REF									"	C82
XI-		CAPACITOR,FIXED,ELECTROLYTIC: CS13BE100K (81349)	EA	2									"	C83
XI-		CAPACITOR,FIXED,ELECTROLYTIC: CS13BE100K (81349)	EA	REF									"	C85
XI-		CAPACITOR,FIXED,ELECTROLYTIC: CS13BE330K (81349)	EA	1									"	C88
XI-		CAPACITOR,FIXED,ELECTROLYTIC: CS13BF330K (81349)	EA	3									"	C84
XI-		CAPACITOR,FIXED,ELECTROLYTIC: CS13BF330K (81349)	EA	REF									"	C86
XI-		CAPACITOR,FIXED,ELECTROLYTIC: CS13BF330K (81349)	EA	REF									"	C87
XI-	5905-683-2243	RESISTOR,FIXED,COMPOSITION: RC07GF151J (81349)	EA	1									"	R81
XI-	5905-683-7723	RESISTOR,FIXED,COMPOSITION: RC07GF152J (81349)	EA	1									"	R92
XI-	5905-723-5251	RESISTOR,FIXED,COMPOSITION: RC07GF222J (81349)	EA	1									"	R82
XI-	5905-686-3798	RESISTOR,FIXED,COMPOSITION: RC07GF272J (81349)	EA	1									"	R86
XI-	5905-681-9969	RESISTOR,FIXED,COMPOSITION: RC07GF332J (81349)	EA	1									"	R87
XI-	5905-835-1633	RESISTOR,FIXED,COMPOSITION: RC07GF360J (81349)	EA	1									"	R85
XI-	5905-820-9124	RESISTOR,FIXED,COMPOSITION: RC07GF390J (81349)	EA	1									"	R91

SECTION II REPAIR PARTS FOR DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE (CONTINUED)

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REFERENCE NUMBER & MFR. CODE / USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30-DAY DS MAINT ALLOWANCE (a) 1-20	(b) 21-50	(c) 51-100	(7) 30-DAY GS MAINT ALLOWANCE (a) 1-20	(b) 21-50	(c) 51-100	(8) 1 YR ALW PER EQUIP CNTGCY	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATIONS (a) FIG NO.	(b) ITEM NO. OR REFERENCE DESIGNATION
XI-	5905-683-2236	RESISTOR,FIXED,COMPOSITION: RC07GF391J (81349)	EA	1									3-6, 3-7	R89
XI-	5905-802-6730	RESISTOR,FIXED,COMPOSITION: RC07GF470J (81349)	EA	1									"	R93
XI-	5905-683-2242	RESISTOR,FIXED,COMPOSITION: RC07GF471J (81349)	EA	1									"	R88
XI-	5905-686-9998	RESISTOR,FIXED,COMPOSITION: RC07GF472J (81349)	EA	1									"	R84
XI-	5905-691-0195	RESISTOR,FIXED,COMPOSITION: RC07GF562J (81349)	EA	1									"	R83
XI-	5905-195-6806	RESISTOR,FIXED,COMPOSITION: RC20GF102J (81349)	EA	1									"	R90
XI-		STRIP,CUSHION: SM-B-415989 (80063)	EA	1									C-2	ATI
XI-		COVER,ASSEMBLY: SM-D-415209 (80063)	EA	1									C-1	A702
P -D		SCREW,MACHINE: SM-C-413884-7 (80063)	EA	4							*	*	"	A702H4
P -F		PACKING,PREFORMED: SM-C-414114-11 (80063)	EA	1	*	*	*	*	*	*	*	*	"	A702MP1
M -D	5330-892-4109	PAD: SM-C-415192-2 (80063)	EA	1									"	A702AT1
XI-		COVER: SM-D-415211 (80063)	EA	1									"	A702MP2
P -D	5310-820-5827	WASHER,LOCK: MS35338-5 (96906)	EA	4							*	*	"	A702H5
XI-		HOUSING,ASSEMBLY: SM-C-415212 (80063)	EA	1									"	A703
P -D	5340-823-5249	INSERT,SCREW THREAD: NM13832-18 (73957)	EA	3							*	*	"	A703M1
P -D	5340-823-5327	INSERT,SCREW THREAD: NM16432-18 (73957)	EA	2							*	*	"	A703M2
P -D	5340-451-6181	INSERT,SCREW THREAD: HM19032-18 (73957)	EA	4							*	*	"	A703M3
P -D	5340-451-8285	INSERT,SCREW THREAD: HM25028-18 (73957)	EA	2							*	*	"	A703M4
XI-		HOUSING: SM-D-415214 (80063)	EA	1									"	A703
M -D	5315-598-7285	PIN,STRAIGHT,HEADLESS: MS171494 (96906)	EA	3									"	A703H3
M -D		HARNESS,ASSEMBLY: SM-D-415217 (80063)	EA	1									"	W701
P -D	5305-638-3435	SCREW,MACHINE: MS35223-25 (96906)	EA	3							*	*	"	H708M3
P -D	5310-209-0788	WASHER,LOCK: MS35335-30 (96906)	EA	3							*	*	"	H711M3
P -D	5935-853-6676	CONNECTOR,PLUG,ELECTRICAL: SM-D-414991 (80063)	EA	2							*	*	"	W701J701
P -D	5935-853-6676	CONNECTOR,PLUG,ELECTRICAL: SM-D-414991 (80063)	EA	REF							*	*	"	W701J702
P -D	5930-886-8133	SWITCH,ROTARY: SM-D-415188 (80063)	EA	2							*	*	"	W701S701
P -D	5930-886-8133	SWITCH,ROTARY: SM-D-415188 (80063)	EA	REF							*	*	"	W701S702
P -D	5940-050-2308	TERMINAL,LUG: MS35431-3 (96906)	EA	3							*	*	"	W701E701

SECTION II REPAIR PARTS FOR DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE (CONTINUED)

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REFERENCE NUMBER & MFR. CODE / USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30-DAY DS MAINT ALLOWANCE (a) 1-20	(b) 21-50	(c) 51-100	(7) 30-DAY GS MAINT ALLOWANCE (a) 1-20	(b) 21-50	(c) 51-100	(8) 1 YR ALW PER EQUIP CNTGCY	(9) DEPOT MAINT ALW PER 100 EQUIP	(10) ILLUSTRATIONS (a) FIG NO.	(b) ITEM NO. OR REFERENCE DESIGNATION
P -D	5935-856-9772	CONNECTOR,PLUG,ELECTRICAL: SM-C-415681 (80063)	EA	2							*	*	C-1	W701J703
P -D	5935-856-9772	CONNECTOR,PLUG,ELECTRICAL: SM-C-415681 (80063)	EA	REF							*	*	"	W701J704
XI-		NUT,PLAIN,ROUND: SM-B-415684 (96906)	EA	2									"	W701H1
P -D	5905-299-1541	RESISTOR,FIXED,COMPOSITION: RC20GF151J (81349)	EA	2							*	*	"	R702
P -D	5905-299-1541	RESISTOR,FIXED,COMPOSITION: RC20GF151J (81349)	EA	REF							*	*	"	R703
P -O	5355-656-1358	KNOB: MS91525-2 (96906)	EA	2	*	*	*	*	*	*	*	*	"	MP703
P -O	5355-656-1358	KNOB: MS91525-2 (96906)	EA	REF	*	*	*	*	*	*	*	*	"	MP704
P -D	5305-893-8484	SCREW,SELF-LOCKING: LP35223-27 (16941)	EA	2							*	*	"	H701
M -D		KIT,MOUNTING,HARDWARE: SM-B-415215 (80063)	EA	1									C-3	A704
M -D		BAG,COTTON: SM-B-415047 (80063)	EA	1									"	A704MP1
P -D		SCREW,MACHINE: SM-C-415048-2 (80063)	EA	1							*	*	"	A704H3
P -D	5310-582-5615	NUT,PLAIN,HEXAGON: MS35690-522 (96906)	EA	3							*	*	"	A704H4
P -D	5310-275-9265	WASHER,LOCK: 4018-24-00 (78189)	EA	6							*	*	"	A704H6
P -O	5935-933-3752	DUST,CAP: SM-B-104328 (96906)	EA	2	*	*	*	*	*	*	*	*	C-1	MP705
P -O	5935-933-3752	DUST,CAP: SM-B-104328 (96906)	EA	REF	*	*	*	*	*	*	*	*	C-1	MP706

SECTION III. INDEX-FEDERAL STOCK NUMBER AND REFERENCE NUMBER CROSS REFERENCE TO FIGURE AND ITEM NUMBER OR REFERENCE DESIGNATION (C-2299/VRC)

FEDERAL STOCK NUMBER	FIGURE NUMBER	ITEM NUMBER OR REF. DESIGNATION
5305-451-6179	C-1	A701H2
5305-625-5745	"	MP702
5305-638-3435	"	H708M3
5305-823-5837	"	A702H4
5305-893-8484	"	H701
5305-903-0339	"	H701
5310-167-0815	"	A701MP1H4
5310-209-0788	"	H711M3
5310-275-9265	C-3	A704H6
5310-543-2410	C-1	A701MP1H3
5310-582-5615	C-3	A704H3
5310-820-5827	C-1	A702H5
5310-853-9676	"	H702
5315-598-7285	"	A703H3
5325-885-7725	C-2	A2H4
5330-892-4109	C-1	A702MP1
5340-451-6181	"	A703M3
5340-451-8285	"	H701
5340-823-5249	"	A703M1
5340-823-5327	"	A703M2
5355-656-1358	"	H701
5355-853-6384	"	MP703
5820-886-3152	"	A80
5820-949-9907	3-6, 3-7	R89
5820-999-7300	"	E1, E2
5905-195-6806	"	R90
5905-299-1541	C-1	E704, E705
5905-681-9969	3-6, 3-7	R87
5905-683-2236	"	R89
5905-683-2242	"	R88
5905-683-2243	"	R81
5905-683-7723	"	R92
5905-686-3798	"	R86
5905-686-9998	"	R84
5905-691-0195	"	R83
5905-723-5251	3-6, 3-7	R82
5905-802-6730	"	R93
5905-820-9124	"	R91
5905-835-1633	"	R85
5905-865-6301	C-1	R701
5910-838-9421	3-6, 3-7	C81
5910-838-9421	"	C82
5930-886-8133	C-1	W701S701
5935-853-6676	"	W701J701
5935-856-9772	"	W701J703
5935-933-3752	"	MP705
5940-050-2308	"	W701E701
5940-082-4622	"	A701MP1
5940-673-1024	"	A701E1
5940-926-9736	"	E704, E705
5950-802-1805	3-6, 3-7	L81
5961-892-3473	"	Q81
5961-892-3473	"	Q82
5961-892-3473	"	Q83
REFERENCE NUMBER		
AN960-4	C-1	A701MP1H4
A10012	3-6, 3-7	AT1
A10012	"	AT2
CK60AW102M	"	C81
CK60AW102M	"	C82
CS13BE100K	"	C83
CS13BE100K	"	C85
CS13BE330K	"	C88
CS13BF330K	"	C84
CS13BF330K	"	C88
CS13BF330K	"	C87
HM19032-18	C-1	A703M3
HM25028-18	C-1	H701
JAN2N526	3-6, 3-7	Q81

SECTION III. INDEX-FEDERAL STOCK NUMBER AND REFERENCE NUMBER CROSS REFERENCE TO FIGURE AND ITEM NUMBER OR REFERENCE DESIGNATION (CONTINUED)

FEDERAL STOCK NUMBER	FIGURE NUMBER	ITEM NUMBER OR REF. DESIGNATION
JAN2N526	3-6, 3-7	Q82
JAN2N526	"	Q83
LP35223-27	C-1	H701
MS171494	"	A703H3
MS35223-1	"	MP702
MS35223-25	"	H708M3
MS35335-30	"	H711M3
MS35338-5	"	A702H5
MS35338-40	"	A701MP1H3
MS35431-3	"	W701E701
MS35690-522	C-3	A704H4
MS75008-8	3-6, 3-7	L81
MS91525-2	C-1	H701
NM13832-18	"	A703M1
NM16432-18	"	A703M2
RC07GF151J	3-6, 3-7	R81
RC07GF152J	"	R92
RC07GF222J	"	R82
RC07GF272J	"	R86
RC07GF332J	"	R87
RC07GF360J	"	R85
RC07GF390J	"	R91
RC07GF391J	"	R89
RC07GF470J	"	R93
RC07GF471J	"	R88
RC07GF472J	"	R84
RC07GF562J	"	R83
RC20GF102J	"	R90
RC20GF151J	C-1	E704, E705
SE34	C-2	A2H4
SMB104328	C-1	MP705
SMB413837	C-2	H1
SMB413841-1	3-6, 3-7	E1, E2
SMB415047	C-3	A704MP1
SMB415684	C-1	W701H1
SMB415989	C-2	AT1
SMC13531-14	C-1	A701MP1H2
SMC413884-7	"	A702H4
SMC413884-11	"	A701H2
SMC414114-11	"	A702MP1
SMC414131-2	"	H701
SMC414399	"	MP703
SMC414114-11	"	A702MP1
SMC414403	"	E704, E705
SMC415048-2	C-3	A704H4
SMC415190	C-1	MP702H2
SMC415192-1	"	AT701
SMC415192-2	"	A702AT1
SMC415193	"	A701MP1
SMC415193	"	A701MP1
SMC415195	"	A701MP1
SMC415196	"	A701MP2
SMC415198	"	A80
SMC415201	C-2	MP2
SMC415205	3-6, 3-7	A2TB1
SMC415212	C-1	A703
SMC415681	"	W701J703
SMD414991	"	W701J701
SMD415188	"	W701S701
SMD415189	"	R701
SMD415200	C-2	MP1
SMD415203	3-6, 3-7	R89
SMD415207	"	A2TB1
SMD415209	C-1	A702
SMD415211	"	A702
SMD415214	"	A703
SMD415217	"	W701
S5867	C-2	A2H4
S7892	C-1	H702
X2081B	C-1	A701E1
4018-24-00	C-3	A704H6

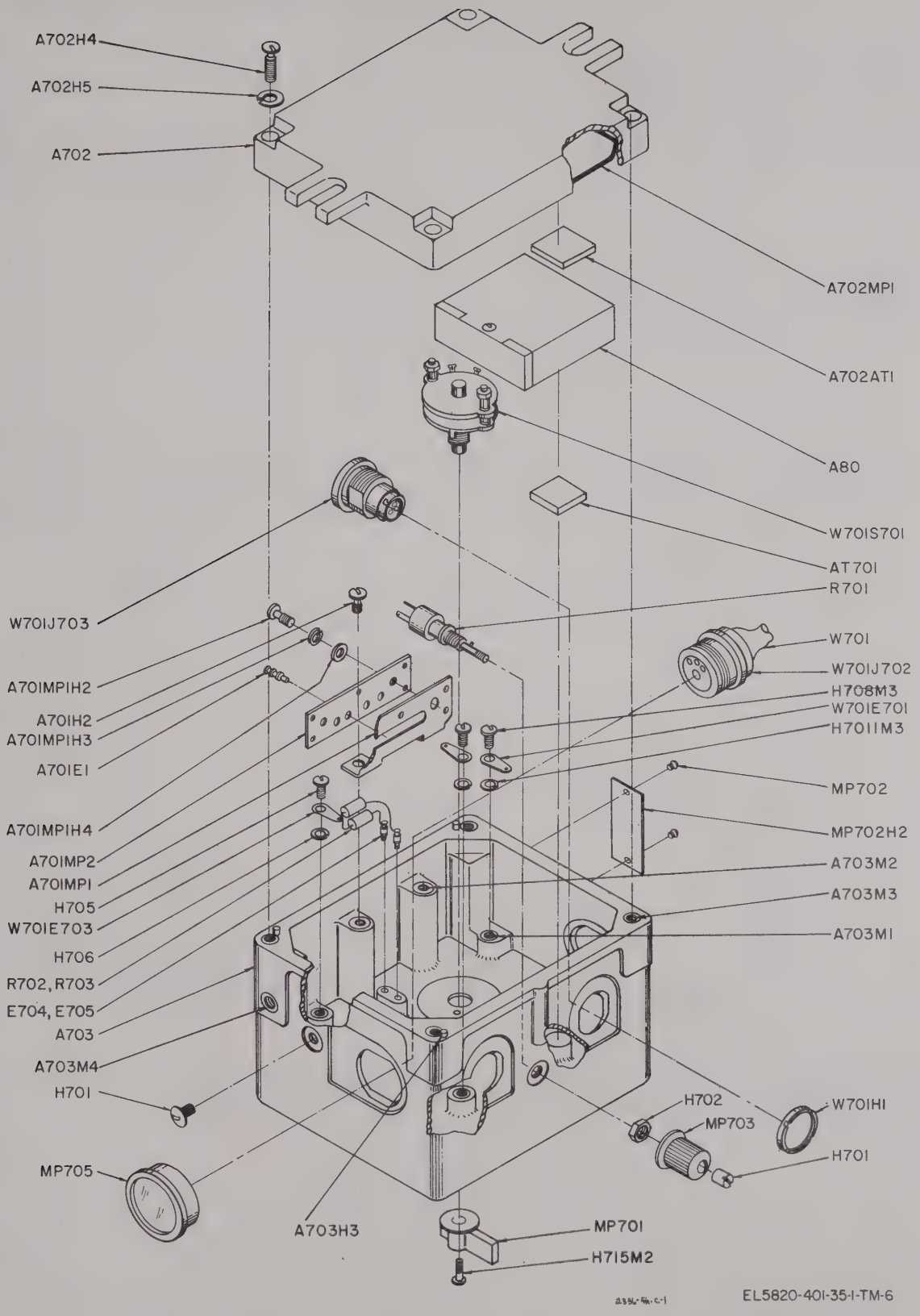


Figure C-1. Control, Radio Set C-2299/VRC, exploded view, parts location.

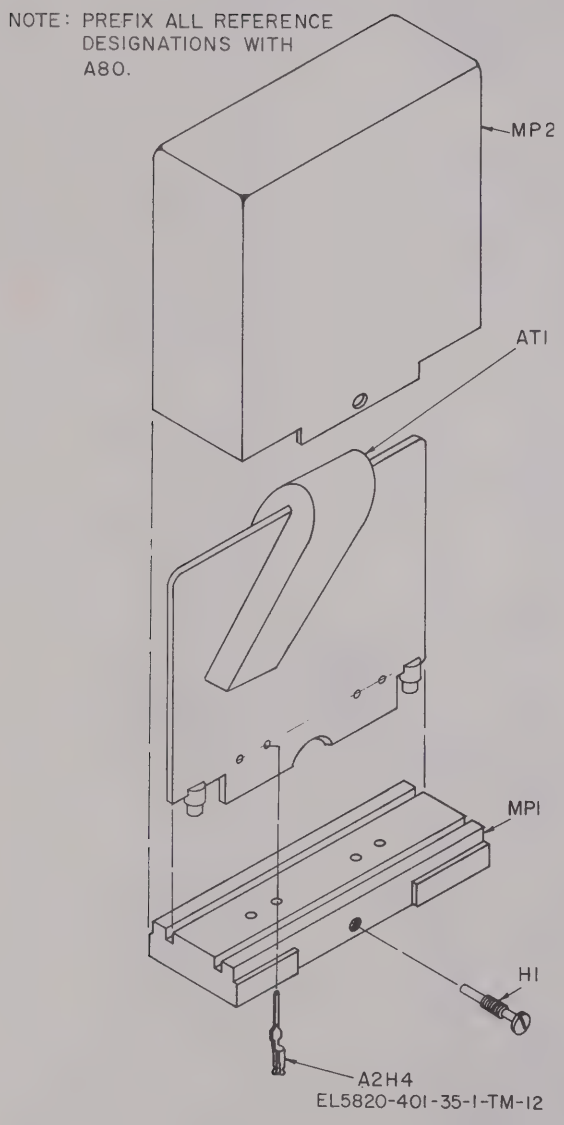


Figure C-2. Audio Frequency amplifier A80, exploded view, parts location.

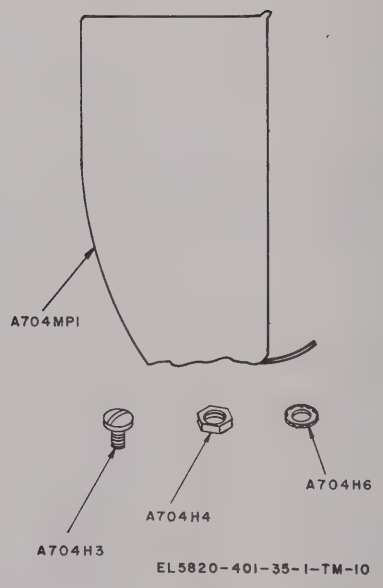


Figure C-3. Hardware mounting kit for C-2299/VRC, parts.

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